

UN

DA

UNITED STATES CONSULAR REPORTS.

CATTLE

AND

DAIRY FARMING.



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SECRETARY'S

Cape Colony
Mauritius (C)
Morocco (C)
Seychelles (C)
Sierra Leone
Zanzibar (C)

North America
Dominion
Ontario

C
C
C
C
C
C
C
C
C
C
C

Quebec

C

C

Prince

C

Mexico:

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Central America

C

South America

Argentina

C

Brazil:

C

Colombia

C

Ecuador

C

Peru:

C

Uruguay

C

Venezuela

C

C

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24	Bull
25	Cow
343	Cow
344	Bull
345	Cow
10	Heif
11	Ox
24	Bull
29	Bull
30	Cow
40	Bull
41	Ox
42	Cow
43	Cow
349	Bull
350	Heif
5	Ox
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22	Bull
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356	Cow.
357	Cow.
358	Cow.
359	Cow.
361	Cow.
362	Cow.
363	Bull.
364	Cow.
365	Cow.
20	Ox.
21	Yearling.
36	Ox.
37	Cow.
366	Yearling.
15	Bull.
340	Cow.
74	Cow.
75	Cow.
76	Bull.
77	Bull.
78	Ox.
79	Cow.
80	Ox.
81	Cow.
82	Bull.
83	Ox.
84	Ox.
85	Ox.
122	Cow.
124	Milch cow.
125	Cow.
86	Cow.
87	Bull.
88	Ox.
89	Bull.
90	Cow.
91	Cow.
92	Bull.
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JANUARY 29

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LETTER
FROM
THE SECRETARY OF STATE,
TRANSMITTING TO

The Speaker of the House of Representatives reports, in reply to a Department circular, from the consuls of the United States, on cattle and dairy farming and the markets for cattle, beef, and dairy products in their several districts.

JANUARY 28, 1886.—Referred to the Committee on Agriculture and ordered to be printed.

DEPARTMENT OF STATE,
Washington, January 26, 1886.

SIR: At the request of some of our leading stockmen, a circular, dated July 18, 1883, covering the question of cattle and cattle products in foreign countries, was transmitted to our consuls, with the view of receiving therefrom such information as might be useful to the stock-breeders and dairy farmers of the United States in their efforts to improve our native stock, and to develop a foreign market for our surplus cattle and cattle products. I have now the honor to submit herewith the reports received in answer to this circular.

The forms presented by the stockmen, and which were incorporated into the circular, were so contracted in scope and so technical in arrangement as to satisfy the Department that the consular responses thereto would not cover the many interests involved; hence some memoranda, in the form of suggestions and directions, were added. The principal points covered by these memoranda were as follows:

- (1) The best methods of exporting cattle to the United States; the best animals to export; the best routes of export and the estimated cost for freight; the purchasing prices of the animals and the estimated expenses for attendance and food while en route.
- (2) The total number of cattle in each district or country and the percentage of the several breeds; the percentage for the dairy and the butcher; the increase or decrease of stock, and the causes thereof.
- (3) Whether the stock of each country is sufficient for home demands; if in excess of home demands, the countries to which the excess is exported; if insufficient for home demands, the countries from which the needed supplies are drawn.
- (4) How much of these supplies, and their nature, is drawn from the United States; the best means for increasing the exports to each country from the United States.

In regard to that part of the general subject under consideration which deals with the breeds of cattle, their feeding, housing, and band-

ling, the best breeds for importation into the United States and the best manner of importation hitherto, and the various other points connected therewith, and which from their nature, being altogether matters of detail, are incapable of being compressed into such statistical compactness as would render them available or useful in a short introductory letter, those interested are referred to the several reports, which are both exhaustive and valuable, being prepared in many instances by recognized authors and experts, or from information directly supplied by such. That portion of the subject, however, which deals with foreign meat and dairy-produce markets, our present share in supplying the same, and the best means for the enlargement of our trade therein, being more susceptible of profitable statistical analyses than cattle-breeding, the following figures are submitted, in the interest of our exporters of cattle and cattle products.

LIVE-CATTLE TRADE.

It would seem as if the cattle, meat, and dairy producers of the world—that portion, at least, which prosecutes advanced agriculture—look to the British markets for the consumption of their surplus products. Outside of our oleomargarine trade with Holland, and a comparatively small export of salted beef, tallow, butter, and cheese to Canada, the West Indies, &c., our trade in cattle and cattle products is with the United Kingdom, as the following statement will show:

Statement showing the exports of cattle and cattle products from the United States during the year 1884.

Description.	To the United Kingdom.	To all other countries.	Total.
Horned cattle	\$17,326,606	\$518,889	\$17,855,495
Fresh beef	11,516,369	470,062	11,987,331
Canned beef	2,542,122	631,645	3,173,767
Salted beef	2,058,383	1,143,892	3,202,275
Other beef	60,028	7,730	67,758
Butter	1,876,341	1,874,430	3,750,771
Cheese	10,508,526	1,155,187	11,663,713
Beef tallow	2,911,008	1,852,367	4,763,375
Oleomargarine	269,020	4,635,342	4,842,362
Condensed milk	263,008	45,321	248,329
Total	49,251,411	12,333,705	61,585,116

In the column of exports "to all other countries" are products exported to Canada to the value of \$2,635,418, a large portion of which was re-exported to England, and oleomargarine to Holland, which also found its way as "butter" to the British markets, as will appear further on, to the value of \$4,127,827. This would reduce the exports to all other countries at least \$5,000,000, and increase those to the United Kingdom by that amount. Our exports during the year may therefore be set down as follows: To the United Kingdom, \$54,250,000; to all other countries in Europe, \$3,200,000; to all countries outside of Europe, \$4,108,176.

It will thus be seen that statistics showing the conditions which prevail in the British markets, and the means which must be taken to hold and enlarge our interests therein, cover, for all practical purposes, our commercial relations with the outside world, as far as our exports of cattle and cattle products are concerned. The other countries of Europe essay to supply their own wants in this regard, and mainly succeed in so doing, having a small surplus for export besides. It should, however, be borne in mind that many of those countries are relatively no

richer in consumption of meat-eating countries on occasions.

The same is true, in regard to the other portion of our trade, which is overlooked in the United Kingdom, and by which it is prior production and as done much to our anxiety and loss and to themselves in the British of their producers.

Statement showing the exports of cattle and cattle products from the United States during the year 1884, British official

United States	
British North America	
Denmark	
Portugal	
Germany	
Spain	
Sweden	
Holland	
Norway	
Channel Islands	
West Africa	

Total

Denmark	
Germany	
Sweden	
Channel Islands	
British North America	
Holland	
United States	
Norway	

Total

Holland	
Denmark	
Sweden	
Channel Islands	
All other	

Total

richer in cattle and cattle products than the United Kingdom, but their consumption of meat food is very limited, while the British people are a meat-eating people; indeed, they may be looked upon as the only meat-eating people in Europe, for the general populations of the other countries regard meat as a luxury, to be enjoyed sparingly on rare occasions.

The same may be generally asserted, though in a more modified degree, in regard to the general consumption of butter and cheese. Hence, while the other countries of Europe offer limited fields for the consumption of our cattle products, fields which are, but which should not be, overlooked in our efforts to supply the imperial demands of the United Kingdom, we must continue to look upon the latter as our principal market, and direct our best efforts toward fulfilling all the conditions by which it is governed, and continue to give the British people superior products, at prices which will leave as little cause for dissatisfaction and as little room for successful competition as possible. We have done much to control the supply of the British market, but we have, in our anxiety to reach voluminous results, neglected many details, to our loss and to the advantage of those countries which have established themselves in British esteem, and which command a successful trade in the British market, by extreme care and attention in the preparation of their products—in fine, by specially catering to the tastes of the consumers.

Statement showing the number and value of cattle imported into the United Kingdom during the year 1884, the countries whence imported, and their value per head, as compiled from British official statistics.

OXEN AND BULLS.

Whence imported.	Number.	Value.	Value per head.
United States	139,213	\$16,129,600	\$115 70
British North America	59,054	6,123,600	103 69
Denmark	42,746	4,100,160	97 32
Portugal	17,903	1,866,240	104 24
Germany	17,310	1,681,560	97 14
Spain	17,462	1,589,220	90 91
Sweden	12,426	1,265,280	97 00
Holland	2,561	247,860	96 74
Norway	865	84,078	97 08
Channel Islands	131	21,778	164 72
West Africa	6	170	34 00
Total	309,696	33,100,346	106 88

COWS.

Denmark	44,167	\$4,218,480	\$95 51
Germany	7,182	628,398	87 49
Sweden	4,110	394,632	96 02
Channel Islands	2,160	256,608	118 53
British North America	1,077	195,858	99 07
Holland	1,123	86,508	77 03
United States	487	52,002	106 78
Norway	167	10,084	94 24
Total	61,314	5,842,570	95 29

CALVES.

Holland	41,354	\$857,134	\$23 14
Denmark	9,349	180,624	19 06
Sweden	3,371	81,793	24 26
Channel Islands	356	25,482	71 44
All other	67	928	13 85
Total	54,497	1,251,911	22 97

From the foregoing statement showing the imports of oxen and bulls into the United Kingdom—that is, butcher stock—it will be seen that American cattle, if we except the Channel Islands cattle, which are imported for breeding purposes, command higher prices than the cattle imported from any other country, and we may assume that the best butcher stock of the world is represented in that market. The cattle imported from Canada, although analogous to American cattle, are valued at more than \$12 per head less than our cattle, while those of European countries are valued at from \$25 to \$18 per head less than ours, with the exception of Portuguese cattle, which only fall short \$11.55 per head.

This, therefore, bears out some of our consuls in their assertions that American cattle are the best general cattle in the world. Having the finest cattle ranges and most favorable climate for cattle-raising, the superiority of our cattle, as asserted in the British markets, is surprising only to those who have been in the habit—persons who assume rather than reason—of connecting high-grade cattle with the Old World only. The superiority of our cattle and cattle ranges is nowhere better understood than by the advanced and intelligent cattlemen of Ontario. This is verified in many ways, but in no way more emphatically than by the fact that Canadian cattle companies, in order to keep up to the demands of the British markets—Canadian cattle falling far below American cattle therein—have been forced to leave Canadian pastures for those of the United States, as a report upon the subject from the consul at Sherbrooke will substantiate. The intelligent and sensible efforts of those companies for the improvement of their vast herds are worthy of deep study on the part of our cattlemen.

The Ontario Agricultural Commission, in the report of its proceedings published in 1881, refers in complimentary terms to the superiority of American cattle. Mr. A. J. Thompson, a large shipper of Canadian cattle to England, testified as follows before the commission:

The animals that come from Kansas City are far superior to Canadian grain-fed cattle; there is no comparison between them. People have the idea that there is no breeding among the cattle in the Western States, but this is a great mistake, for these cattle are all pretty well bred.

A statement, attached hereto, has been prepared which shows the importations of cattle (cows and calves omitted) into the United Kingdom during the eleven years ending with the year 1884. These details embrace the beginning and development of our cattle and fresh-beef trade with that country, and are of special interest to our cattlemen and packers.

This statement goes to show that our exportations of cattle to Europe really began in the year 1877—previous exportations being more or less in the nature of experiments—and reached their maximum in 1880; the imports into the United Kingdom from the United States during that year amounting to \$17,889,174, against \$16,120,600 during the year 1884.

The magnitude to which this trade would have grown were it not for adverse legislation—legislation the result of fear lest cattle disease might be introduced into the United Kingdom through the free import of American cattle—which hampered the landing, and the handling and killing after landing, of the animals, would only have been limited by our capacity to supply the demand.

The changes which have taken place in the British foreign cattle trade during the decade ending with 1884, and the relative positions of

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the countries from which the cattle were drawn at the beginning and end of the decade, are shown in the following statement:

Statement showing the number of oxen imported into the United Kingdom during the years 1875 and 1884.

[The countries from whence imported are given in the order of their importance in 1884, the figures in parentheses showing their relative order in 1875.]

Whence imported.	1875.	1884.	Whence imported.	1875.	1884.
United States (10).....	200	130,213	Sweden (8).....	3,637	12,426
Canada (9).....	1,212	59,051	Holland (3).....	27,396	2,501
Denmark (2).....	29,687	42,746	Norway (11).....	227	805
Portugal (5).....	21,632	17,963	Belgium (7).....	7,139	.....
Spain (4).....	23,850	17,482	France (6).....	8,986	.....
Germany (1).....	50,141	17,510			

It will here be seen that of all the European countries which contributed in 1875 to the British cattle trade, Denmark and Sweden only show an increase in 1884. Germany, which held a good first place in 1875, has fallen to the sixth place in 1884, its exports in the latter year being not much over one-third what they were in 1875, while Belgium and France have fallen out of the trade altogether. It follows that were the United Kingdom dependent upon Europe to-day for its foreign meat supplies, the British people would have to eat less beef or pay far more for what they consume than they now pay. One principle seems to be established in the foregoing showing, viz, that the United Kingdom can rely no longer upon Europe for its foreign-cattle wants, and that the United States must, for some years at least, be looked to for the greater portion of such supplies.

THE FRESH-BEEF TRADE.

As the trade in fresh beef is so closely connected with the trade in live cattle, and as the former has so much bearing upon the latter as to make it impossible to discuss understandingly the one without taking the other into consideration, the following statistics concerning the fresh-beef importations into the United Kingdom are given:

Statement showing the quantities and value of the fresh beef imported into the United Kingdom from the several countries during the year 1884.

Whence imported.	Quantity.	Value.	Value per pound.
	<i>Pounds.</i>		<i>Cents.</i>
United States.....	90,904,128	\$10,724,579	11.80
Russia.....	3,551,184	352,107	9.92
Canada.....	2,643,872	320,531	12.12
Germany.....	711,648	89,469	12.56
Australasia.....	308,448	32,843	10.64
France.....	164,272	17,593	16.88
Other countries.....	151,648	16,018	10.56
Total.....	98,375,200	11,553,080	11.74

This statement shows that we virtually monopolize the trade of the United Kingdom in foreign fresh beef.

The imports of fresh beef into the United Kingdom in 1874 amounted to about 3,773,464 pounds, of which 3,650,784 pounds were imported

from Germany, and only 122,680 pounds from the United States. Our own official returns make no special mention of any exports of fresh beef before the year 1877, when 49,210,990 pounds—the whole export—were shipped to the United Kingdom. Our trade in fresh beef has sprung into sudden magnitude, having steadily increased from 49,210,990 pounds, valued at \$4,552,523, in 1877, to 120,784,064 pounds, valued at \$11,987,331, in 1884.

The British official returns place the following per-pound value upon the imports of fresh beef into the kingdom during the years 1880, 1881, 1882, 1883, and 1884:

Whence imported.	1880.	1881.	1882.	1883.	1884.
	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>
United States	11.27	11.48	12.06	12.22	11.80
Canada	11.03	12.51	11.30	12.04	12.12
Russia				10.84	9.72
Germany	13.31	11.56	11.71	12.01	12.56
Australasia				12.06	10.61
France				13.10	16.88

It will be seen that American beef maintained the lead of all countries from which meat is drawn in any quantity. The slight price decrease in 1884 can have no significance when the immense quantity imported from the United States (90,904,128 pounds) is taken into consideration.

Our consular reports a few years back repeatedly referred to the prejudice existing in Great Britain against American beef, while at the same time the British people were unknowingly proving the groundlessness for such prejudice by eating large quantities thereof under the name of prime English beef—a trick of the butchers, who had helped to create and maintain the prejudice referred to.

The consuls asserted that this prejudice, principally engendered and sustained by the butchers, whose interests it was feared would be injured by the American fresh-beef trade, required for its total dissipation only comprehensive and intelligent action on the part of our exporters in placing their meat properly before the British people, who would undoubtedly consult and conserve their own interests in the premises.

Central meat depots, with outlying shops in the principal cities of the kingdom, controlled and directed by British agents in the employ of the American shippers, or having an interest in the business, were suggested as the radical remedy for the immediate development of an almost unlimited trade in fresh beef.

Recent reports make no reference to this phase of the trade, and it is to be assumed that the British public have become more or less convinced that American cattle and American meats are the very best in the world, outside of, perhaps, their own selected cattle and beef. It may even be doubted whether the best forced-fed English beef is any better than the beef raised on our rich and succulent ranges.

The following extracts from a report written by the consul at Manchester in 1882 will illustrate this peculiar phase of our fresh-beef trade in England:

The wide difference between the price English butchers pay our American exporters for their meats, as compared with the price they charge for the same at retail, leads me to again refer to the great need of the adoption of better methods for placing our meats on sale here.

At present the English dealer makes an unmade profit out of the American meat supply. This is often done by misrepresenting the kind of meat he sells, for it is a common practice, I am credibly informed, to claim that the beef, mutton, &c., on sale

is all English American preservation, piled with a was convers told me. H Manchester, long bill of forgot that a statement of dealer to che American be And now I would be a w take steps to Several years ters, but owin and also on a source of sup the supply wa things which the experimen way everywho ceive at least butchers here reduction from good beef wor cheaper meat eat beef on acc its right name duces and cons an undue profit

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is all English, when, in fact, most of the weight on hand has just come from the American supply at Liverpool. Not long ago a case in point came under my own observation. I made inquiry of a retail butcher if he sold American meats, and he replied with some warmth, "No, sir, I could not sell it here." The same afternoon I was conversing with a gentleman, and incidentally mentioned what the butcher had told me. He laughed and said, "Two days ago I was coming down — street in Manchester, and saw this same butcher drop a paper. I picked it up, and it was a long bill of American meat, and when he assured you he sold no American beef he forgot that *all* his stock that day was *American* beef, and *American* only!" This plain statement of a fact illustrates how easy it has heretofore been for the English retail dealer to cheat and deceive consumers as to the beef sold. The prejudice against American beef is largely a thing of the past.

And now that consumers are learning the tricks played upon them by butchers, it would be a wise plan, in my opinion, for American exporters of beef and mutton to take steps to compel fair dealing, to say the least, on the part of retail butchers here. Several years ago shops for the sale of American meats were opened in various centers, but owing to the hue and cry raised against them by the retail trade generally, and also on account of the prejudices with which consumers always regard a new source of supplies of food for this country, the plan did not prove a success. Besides, the supply was, owing to the uncertainty of the new enterprise, irregular—a state of things which no longer exists. I believe the present is a favorable time to repeat the experiment under wise and judicious management. Our meats have won their price at least 2 cents a pound more for good reason why our exporters should not re-butcher here a round profit, and enabling the consumer to purchase the same at a reduction from present prices of from 2 to 3 cents per pound. A cheaper supply of good beef would insure an enormous increase in the quantity consumed, so that cheaper meat would be a great boon to many of the laboring poor, who now rarely eat beef on account of its expense. American meat would be as readily bought under its right name as it is now under a false name, and with this difference—the producer and consumer would each be benefited, where now only the retail dealer reaps the undue profit.

The statistics thus far given go to show that we monopolize, in the sense of supply, the trade in foreign fresh beef in the United Kingdom; and as it would seem to be more desirable for the United States to supply that market altogether with the product in this form, rather than in the form of live cattle, it is to be hoped that those most directly concerned will so perfect and enlarge their systems of preserving and handling as to do away altogether with what under the very best conditions must be a crude and troublesome trade—the shipment of live cattle across the Atlantic.

There can be no doubt that the fresh-beef form would also be more convenient and satisfactory to the British people, and save them all anxiety in regard to the introduction of cattle disease from the United States, of which they seem to stand in constant dread—otherwise there would be no necessity for laws governing the import of live cattle, and regulations for the control of the stock before and after landing, which, as before remarked, greatly retard the trade.

The fullest investigation into the conditions which surround this trade would seem to place the fault—if fault it be—for the shipment of live cattle to Great Britain, there to be converted into meat, instead of shipping from the United States in its meat form, at the doors of our cattlemen and live exporters. The fact that we now ship 90,000,000 pounds of fresh beef annually to the United Kingdom is evidence of our ability to ship three times that amount, and with comparatively less trouble and expense than would be entailed by the shipment of live cattle to produce that amount of meat in England, besides the profit animals, the preparation of the meat, the hides, horns, hoofs, bones, offal, &c., all of which represents so much gold to our manufacturers and agriculturists,

LIVE CATTLE IN THE SEVERAL COUNTRIES.

The following statistics, mainly official, showing the number of cattle in the principal countries wherein cattle-rearing for meat and dairy purposes, or for either, is prosecuted, will enable our stockmen to appreciate the present and prospective conditions which affect this great industry both at home and abroad:

Cattle in the principal countries of Europe.

Countries.	Cows.	All other.	Total.	Number of cattle to each 1,000 inhabitants.
Russia.....			24,088,000	200.0
Norway.....	741,508	275,010	1,016,517	528.0
Sweden.....	1,394,731	790,805	2,191,536	480.0
Denmark.....	898,790	571,288	1,470,078	754.0
Germany.....	8,961,221	6,815,481	15,776,702	341.0
Holland.....	997,839	456,507	1,454,346	357.5
Belgium.....	796,178	586,637	1,382,815	250.5
France.....	7,113,242	4,383,011	11,416,253	303.2
Italy.....	2,366,556	2,416,676	4,783,232	168.1
Austria.....	4,138,625	4,445,452	8,584,077	351.2
Hungary.....	1,740,390	2,857,144	4,597,533	283.9
Spain.....			2,904,598	170.5
Switzerland.....	552,427	547,573	1,100,000	372.3
Portugal.....			520,474	125.1
The United Kingdom.....			10,826,705	268.0
Great Britain.....	2,124,020	4,473,535	6,597,554	210.0
Ireland.....	1,417,421	2,811,270	4,228,751	859.8
Total principal countries.....			92,093,136	283.9

The statistical rules usually applicable for the deduction of results from almost any general industry are of very little practical use when applied to the cattle industry of Europe. The United Kingdom and Russia may be cited in illustration. The former is the largest consumer of foreign cattle among the nations of the world, while the latter is a country upon which the former expects in the very near future to draw for a large portion of its foreign meat supply; yet the United Kingdom has within a fraction of as many cattle as Russia to each 1,000 inhabitants, and if we take the quality of the stock of both countries into consideration—the native breeds, which constitute the general stock of Russia, yielding, according to Consul-General Stanton, “only from 252 to 288 pounds of coarse, unsavory meat”—the odds are largely in favor of the United Kingdom.

Spain, which exports largely to the United Kingdom, has only 170.5 cattle to each 1,000 of its inhabitants; Portugal, with much less than one-half the cattle per capita of the United Kingdom, is another heavy exporter; while France, with a fair average cattle supply—303.2 to each 1,000 inhabitants—imports, over and above its exports, from 70,000 to 75,000 head of cattle per annum for consumption. Consul Williams, of Rouen, says of the beef consumed in France one tenth is imported. The same consul says that France imports beef cattle in large numbers from Italy; yet Italy has the lowest cattle census of the countries of Europe—that is, according to population—Portugal excepted, viz, 168.1 to each 1,000 of its inhabitants.

Among the many conditions which prevail and which influence the interests of the several countries, in so far as those interests come into

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conflict with the cattle and cattle products of the United States in foreign markets, the following may be cited:

(1) The purposes for which the cattle are bred and reared—whether for the dairy or the butcher.

(2) The quality of the cattle.

(3) The home consumption of meat and dairy products.

Spain, Portugal, and Italy are light consumers of these products; hence, with their very low stock rate, their ability to export cattle.

Switzerland, France, Holland, and Belgium are dairy countries; that is, the dairy is the principal interest and the butcher but an incident.

Austria and Hungary have fair cattle supplies, but their export is very limited. This, however, is due principally to the stringent cattle laws of Germany—laws enacted for the protection of German cattle from the introduction of disease.

The exporting cattle countries of Europe are Denmark, Portugal, Spain, Germany, Holland, Sweden, and Russia. From the arbitrary conditions which surround the industry in these countries, and in view of the unlimited fields for its development outside of Europe, it does not appear as if the future held out much promise for cattle-breeding, for export at least, in the Old World.

The United Kingdom being the only country in Europe which imports cattle and fresh beef from countries outside of Europe, such imports may be regarded as those which Europe cannot supply. The international imports and exports between France, Italy, Switzerland, Belgium, Holland, Austria-Hungary, and Russia are sufficient unto themselves, with a small surplus for export to England. This surplus was as follows in 1884:

Cattle.—From Germany, 24,492 head; from Holland, 3,664 head.

Fresh beef.—From Russia, 3,551,184 pounds; from Germany, 711,648 pounds; from France, 104,272 pounds.

This, it will be seen, is a very small surplus for so large a portion of the Continent, and a population of about 250,000,000.

The other countries of Europe, Sweden, Norway, Denmark, Spain, and Portugal, export about 140,000 head of cattle annually. It is to these that Great Britain looks, outside of Ireland, for any regular supply of European cattle.

The total annual wants of the United Kingdom, based upon the assumption that its importations cover its wants, may be estimated at 480,000 head of foreign cattle, or their equivalent in fresh beef. This estimate is based on the following calculations: In 1884 the importations were 61,314 cows, 309,696 oxen, 98,375,200 pounds of fresh beef, and 54,911 calves.

The value of the fresh beef, as may be seen on reference to the statistical table heretofore given, is a little over one-third the value of the oxen, and it is therefore assumed that the 98,375,200 pounds of fresh beef represented one third the number of oxen imported. The greater number of the oxen and nearly all the beef being American, gives additional assurance that this estimate is a very close approximation to the real figures. The value of five calves equaling the value of one ox, this import is equivalent to 5,000 oxen.

The total number of horned cattle, or their equivalent as above, imported into the United Kingdom from European countries during the year 1884 amounted to about 180,000 head, leaving 300,000 head to be supplied by countries outside of Europe. These were drawn from the following countries, fresh beef being converted into cattle as before: From the United States, 231,700 head; from Canada, 64,031 head; from all other places, 1,269 head.

Number of
cattle to
each 1,000
inhabitants.

299.9
528.0
480.0
754.9
341.0
357.5
250.5
303.2
168.1
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It thus appears that nearly one-half of all the foreign fresh beef consumed in the United Kingdom is drawn from the United States.

The foregoing estimates do not include the imports of meat "preserved otherwise than by salting," under which designation considerable quantities of "jerked" or dried beef from South America, and canned and smoked beef from the United States and Australasia, are imported, as witness the following statement:

Imports into the United Kingdom during the year 1884 of meat preserved other than by salting.

Whence imported.	Quantity.	Value.	Value per pound.
	<i>Pounds.</i>		<i>Cents.</i>
United States	20,098,536	\$3,476,642	11.66
Australasia	14,390,728	1,502,697	10.44
Belgium	1,416,128	958,400	67.70
Uruguay	2,614,976	403,385	15.42
Canada	1,564,304	175,237	11.20
Argentine Republic	459,984	82,275	17.89
France	245,392	61,892	25.26
Russia	153,104	30,166	19.71
Norway	158,592	20,572	12.93
Germany	101,360	20,363	20.06
Holland	117,690	20,052	17.07
Brazil	109,576	20,632	18.73
All other	10,640	1,640	15.41
Total	50,509,880	6,780,072	11.46

Here, as in cattle and fresh beef, the United States largely leads, followed in quantity by Australasia, Uruguay, Canada, Belgium, &c., respectively.

Assuming that the future wants of Europe will increase proportionately with the increase of, say, the last fifteen years, and that the increase in its cattle, under the most favorable conditions, cannot be expected to keep pace with the expected increase of population and the constantly increasing use of meat foods among the people—an increase principally due to the fact that the exports from the United States and other non-European countries are bringing meat foods more and more within the purchasing power of the general classes—it may serve a practical purpose for our stockmen, packers, and exporters to study the statistics of the countries which in the near future will be likely to compete with American meats in the British markets—not only in the British markets, but in those of nearly every country in Europe, for it is only a matter of detail in the perfection of the methods for the preservation of fresh beef, and its quick and regular transportation from distant countries, when the breeding and rearing of cattle for meat purposes will be wholly unprofitable, if not practically impossible, in the greater portion of Europe.

The latest official returns and estimates of the number of horned cattle in the principal cattle-rearing countries outside of Europe give the following results:

Countries.	Total number of cattle.	Number to every 1,000 inhabitants.
United States	45,170,000	821.3
Brazil	20,000,000	1,860.7
Argentine Republic	12,000,000	4,724.0
Uruguay	8,000,000	11,428.6
Canada	1,925,000	442.0
Australasia	8,153,000	2,777.6
Total	95,248,000	1,288.9

The figure of horned cattle in the world is 76,000,000, of which the United States has 324,000,000.

In regard to the value of the sea-board trade in the Empire, the city (during the Argentine Republic) Consul Baker, nor a considerable quantity of cattle slaughtered and exported, valued at 1,910,200.

With the increase in the long before the time, it is estimated in that direction, contemplating the future, for our consul, the following results:

The proposal for the Argentine is being made, and it is contended that the cheap food, and particularly, are being used to be made, number 80,000,000, machinery for the German refrigerator, engineer, six weeks the object.

The consul, our people can, which there is.

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The figures in this statement show that there are over 3,600,000 more horned cattle in the six countries given, with a population of about 76,000,000, than there are in the principal countries of Europe—practically the entire continent—heretofore given, with a population of 324,000,000.

In regard to the vast herds of cattle in the Argentine Republic, Uruguay, and Brazil, it may be said, as a rule, that they are at present only valuable for their hides, horns, tallow, &c., very large numbers not being available even for these products, owing to their distance from the seaboard and the lack of transportation facilities. A striking illustration of these conditions is given by the consul-general at Rio de Janeiro, who reports that, notwithstanding the 20,000,000 head of cattle in the Empire, 54,000,000 pounds of dried beef were imported into that city (during the year in which his report was written) from Uruguay and the Argentine Republic. The conditions which prevail in the Argentine Republic are not much better than those which prevail in Brazil, Consul Baker reporting that, with its 12,000,000 cattle, neither milk, butter, nor cheese is produced in the country, and that the beef is of execrable quality.

Cattle in the Argentine Republic and in Uruguay are bred and slaughtered almost wholly for their hides, the exports of which numbered 1,910,218 for the Argentine Republic alone in 1883.

With the increasing demand for beef in Europe, it cannot be very long before the waste beef of South America will be more or less utilized in that direction. The capitalists of Europe, it appears, are already contemplating the import of fresh meats from the Argentine Republic, for our consul at Mayence, in a report dated September 1, 1885, transmits the following clipping from a leading German trade journal:

FRESH-MEAT TRADE WITH ARGENTINE.

The proposal to establish a company to carry on the importation of fresh meat from Argentine is being taken up in various quarters. Hamburg is to be the chief European depot, and 3,000,000 marks (about \$700,000) are proposed as the capital. It is contended that there is a great opening in Germany for a concern which will provide cheap food, and especially flesh, for the people. The La Plata states, and Argentine particularly, are especially eligible for the supply of stock on a large scale. A beginning is to be made with mutton. In the Argentine Republic alone the flocks of sheep number 80,000,000 head. The meat will be brought in cold apartments, the machinery for the Argentine refrigerating establishment being obtained in Germany. German refrigerating machines have proved their efficiency. Recently Herr A. Neubecker, engineer, of Offenbach, made experiments attaining 15° of cold, and after six weeks the object still showed 8°, while for the transport by ship 1° is sufficient.

The consul, in transmitting this "news item," pertinently asks why our people cannot supply some of this "cheap food, especially flesh, for which there is said to be a great opening in Germany."

During the year 1884 we exported over 120,000,000 pounds of fresh beef, of which 115,000,000 pounds went to the United Kingdom, and not a single pound to any other country in Europe. This would seem to imply either one or all of three points, viz, that our exporters have overlooked the German market, that our beef is too dear for that market, or that there is no "great opening" in that market for foreign fresh beef. The second would seem to be the true point, else why should a syndicate be formed for experimenting in Argentine beef, while American beef, beyond the experimental phase, is within easy reach.

In regard to Australasia, noted for its valuable breeds of cattle, as well as for its intelligent cattle-breeding, it may be said to have passed the experimental stage in its exports of fresh beef to the United King-

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Value per pound.	Cents.
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	10.44
	07.56
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	11.20
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dom, as the exports thereto of 308,000 pounds in 1884 would seem to imply. The imports of fresh beef into the United Kingdom from the United States during the year 1875 were only a little greater than those for Australasia in 1884.

The first imports into the United Kingdom of fresh beef from Russia are recorded for the year 1883, viz, 2,462,432 pounds. For 1884 the imports amounted to 3,351,184 pounds, an increase of 889,752 pounds. The initiatory effort in this case is British—British capital and British direction—and great hopes are entertained of enlarging the trade.

It will be noted, in the table showing the imports of fresh beef into the United Kingdom, that the Russian product is valued at 9.92 cents and the American at 11.80 cents per pound. The superiority of the American beef fully warrants this difference in price; but it must not be forgotten that a penny per pound is a matter of considerable moment to the working and trades classes of the United Kingdom, and will go far towards glossing over inferiority in quality. This question of cheapness exerts a controlling influence in every country in Europe, and the country which can supply the cheapest food products can always command an almost unlimited market therein. Our producers, while maintaining the high quality of their products, must never lose sight of this point.

Assuming that in the near future our stockmen and slaughterers will have to contend more or less with Australasia, the Argentine Republic, Russia, &c.—Canada being already an important competitor—for the beef trade of Europe, the question naturally presents itself, how will such competition affect us?

With the present magnificent condition of our vast herds; their superior quality as beef-makers; the intelligence which governs and guides every movement from the plains to the seaboard; our almost perfect railway system, which insures quick transport; the nearness of Europe to our shores, and the unlimited steamship conveyance always available, it does not seem possible that any other country can overmatch us in the European markets. The only drawback to our export trade which can arise is the possibility of our home demands increasing faster than our supply, for the home market is the controlling influence. Whatever may be the results to us and to the other countries which are preparing to enter into this trade, the result to the United Kingdom must be an abundant and cheap supply of beef, for the surplus beef cattle of the world are ever on the move towards London.

DAIRY PRODUCTS IN EUROPE.

Those portions of the consular reports which treat of dairy farming in Europe seem to cover every point contemplated in the Department circular, and they must prove of great interest and value to our dairy farmers. It would be impossible, even were it necessary, to condense their various interesting descriptions of European dairy farming, from the care of the cattle to the manufacture of butter and cheese, and the conditions which surround and influence the industry, from its inception to the disposal of the products. The reports to be fully appreciated in this regard must be read in detail, for the different parts of the subject are dwelt on to minutia, leaving very little for assumptive speculation.

The only phase of the interest which seems to demand any treatment here is, as in the case of cattle and beef, that which deals with the European butter and cheese markets, our share therein, and how to enlarge that share.

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What was said of the cattle surplus of the world finding a market in the United Kingdom is equally true of butter and cheese. The conditions which govern that market may therefore be said to govern all other markets; at least this holds good so far as our exports of dairy products to Europe are concerned.

The following statement shows the amount and value of butter and butterine—for, strange to say, the British customs returns do not distinguish between butter and oleomargarine—imported into the United Kingdom during the year 1884:

Butter and butterine imports.

Whence imported.	Quantity.	Value.	Value per pound.
	<i>Pounds.</i>		<i>Cents.</i>
Holland	124,924,128	\$24,285,575	19.44
France	57,121,008	14,077,530	24.84
Denmark	37,527,504	9,701,052	25.84
Germany	16,177,280	4,180,251	25.84
Sweden	11,464,064	2,887,384	25.12
United States	11,231,472	2,170,982	19.41
Canada	6,208,044	1,243,028	20.02
Belgium	6,740,272	1,348,848	20.00
Norway	3,480,472	610,564	17.51
Russia	1,484,560	202,536	13.64
Australasia	508,480	95,924	18.47
Italy	152,432	36,562	23.92
Channel Islands	100,464	25,085	25.57
British East Indies	101,168	25,146	15.60
Other countries	17,584	3,115	17.72
Total	277,248,832	60,961,191	21.99

It will be noted that Danish butter leads all foreign butter in price per pound in the British market, being higher than even the celebrated Channel Islands butter. This is a fine tribute to what may be called a national effort in this leading industry of Denmark, for Government and people seem to be united in the determination to combine all the advanced appliances for the manufacture of this product with the utmost care and selection of the stock, cleanliness, and care in handling the milk, cream, and butter, and putting the latter on the British market in the most acceptable condition. Next to Denmark, the products of Germany, Sweden, and France stand very high in the British market.

The comparatively low place occupied by the product of Holland should not detract from the noted dairy farmers of that country, it being wholly due to the fact that a great portion of the imports therefrom into the United Kingdom is oleomargarine, or imitation butter. Consul Ryder, in his report on the butter export of Denmark, calls attention to this fact, and the Irish butter-makers, as will be seen on reference to the report from Consul Piatt, of Cork, protest that the Dutch manufacture butterine, or oleomargarine, properly speaking, to imitate Irish butter, in counterfeit packages, and that it is largely sold as Irish butter in England, and even in Ireland.

To properly estimate the amount of this so-called "Dutch butter" imported into the United Kingdom, we have only to compare the imports from Holland in 1877, before oleomargarine had become an industry in that country, and the imports during the year 1884. In the former year the imports were 41,679,085 pounds, against 100,128,032 pounds in 1884. In the former year the British imports of French butter amounted to 16,000,000 pounds more than the imports of Dutch butter, while in 1884 Dutch butter led the French by nearly 44,000,000

pounds. It is, therefore, safe to assume that fully 50,000,000 pounds of the butter imported into the United Kingdom from Holland in the year 1884 was oleomargarine or imitation butter.

In view of the prejudice which exists in Europe against American products, and the belief which prevails, more or less, among the several peoples that adulteration and counterfeiting of food products are more rife in the United States than in the Old World, the open manufacture of oleomargarine into imitation butter, the counterfeiting of well-known brands, and the flooding the British markets therewith, without exciting any special wonder, is most significant. In some the United States we have laws regulating the manufacture of oleomargarine, which laws insist that the product must be plainly branded according to its nature, so that people who so desire can purchase and use it understandingly. That it is permitted to be imported into the United Kingdom under the name of butter, and sold as such, must have a very injurious effect on the legitimate butter trade.

Turning to our exports of butter and oleomargarine (for the distinction is clearly made by our customs), we find that during the year 1884 Holland took of our oleomargarine oil 33,173,849 pounds, valued at \$4,127,827, an average of 12.44 cents per pound. Our total exports of oleomargarine for the year amounted to 39,321,000, valued at \$4,842,000, or 18,693,626, pounds, and \$1,091,229 in excess of our butter exports for the year. Of our exports of oleomargarine not taken by Holland, 2,865,783 pounds of the oil went to Belgium, 1,967,263 pounds of the oil and 421,316 pounds of the imitation butter (the oleomargarine exports being subdesignated imitation butter and the oil by our customs) went to the United Kingdom, and 1,062,360 pounds of the imitation butter to Canada.

There need be little doubt that the greater portion of the export to Holland was converted into "Irish" and "English" butter and consumed as such by the British people. In this connection it is worthy of note that the exports from Holland to the United Kingdom, of which at least one-half was composed of this imitation butter, are valued by the British customs at a fraction per pound more than the real butter imported from the United States.

The decrease in the consumption of American butter in the United Kingdom is noteworthy. The imports thereof in 1879 amounted to 33,231,472 pounds, valued at \$6,041,466, against 11,231,472 pounds, valued at \$2,179,982, in 1884. It is more than probable that this decrease was largely due to the increase in our home consumption, prices in the home market, especially for first quality butter, being more satisfactory than the prices prevailing in the United Kingdom. The decrease was certainly not due to any lessened demand for foreign butter in Great Britain, for the imports during the year 1884 were 15,000,000 pounds in excess of those of 1880; and the fact that so much inferior butter or substitute for butter finds a growing market therein goes to prove that quality has no further bearing on the trade than value in the British market.

The fact that American butter is valued at 6.60 cents per pound less than the Danish, 6.43 cents less than the German, 5.91 cents less than the Swedish, 5.23 cents less than the French, and even a fraction less than the Dutch, one-half of which is imitation butter, should appeal to the pride as well as the profit of our dairy farmers. The high position attained by the Danish, German, and French butter in the British market is the result of special preparation for that market, and the reports of the consuls from those countries show the great care taken in its

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It may be said of the British market that it offers an almost unlimited field for high and low grades of butter. As the Dutch and Belgians, with their imitation butter—for the Belgians, it would also appear, largely manufacture oleomargarine for export to England—will, it is more than likely, be able to supply the low-grade product, we can scarcely hope, even if we so desired, to compete for this trade. The field for high-grade butter is, however, open to our dairy people, and there is no good reason why they, with more favorable primary conditions than can possibly exist in any of the European countries, should not prepare and place upon the British market butter which would stand on a par with the best Danish product. They should study the reports on Danish dairy farming concerning this great industry, and thus learn that the secret of Danish success lies altogether in complying with the laws governing success. If our dairy farmers essay foreign markets at all, they should cater to the tastes of those markets, and it will pay better, even at the expense of more labor and time, to export first-class than inferior butter carelessly made, carelessly packed, and carelessly placed on the markets. The 11,231,472 pounds of American butter imported into the United Kingdom from the United States during the year 1884 at the price received for Danish butter would have yielded our dairy farmers nearly \$750,000 more than was realized therefrom. This large sum can be legitimately charged to indifference on the part of our dairy farmers. This is not the real cost of our indifference, however, for had we catered for the British markets, after the manner of the Danish dairy farmers, our exports would have been fourfold what they were in 1884. Thus some idea may be formed of the consequential damages which have resulted from our remissness in this one industry, which, as said before, is surrounded by more favorable conditions in the United States than in any other country.

In this connection, the attention of our dairy farmer is directed to a report on the Irish butter trade, transmitted by the consul at Cork. As Cork is the chief center of the dairy interest of Ireland—the butter being almost wholly manufactured for the London market—and as Irish butter holds a very high place in English esteem, this report, with its accompanying papers, is of special value.

A table in this report gives the prices of the finest butter in the Cork market for forty years, viz, 1841 to 1881, from which it appears that during the decade ending with 1851 butter averaged 84 shillings per hundred-weight (18.2 cents per pound); during the decade ending with 1861, 104 shillings per hundred-weight (22.6 cents per pound); during the decade ending with 1871, 116 shilling per hundred-weight (26 cents per pound); and during the decade ending with 1881, 131 shillings per hundred-weight (27.9 cents per pound); an increase in the forty years of 47 shillings per hundred-weight (10.2 cents per pound).

In 1881 Danish butter was valued in the English customs at 26.25 cents per pound; in the same year, as the report under consideration shows, Irish butter sold in the Cork markets at 28.8 cents per pound. The costs and charges incident to export must be added hereto to arrive at an estimate of its value in the English market. These figures would go to prove that Irish butter brings the highest price of all foreign butter in the London market. One of the inclosures in Consul Platt's report deals at length with "Irish preserved butter," the writer, an expert in this product, claiming for this particular article great keeping qualities.

Consul Piatt, in referring to this butter, says:

In connection with the subject of canned butter, it may be well to direct the attention of those in the United States interested herein to the opportunity which I am told exists for a large development of American enterprise with respect to this class of the butter. Within seven or eight years, France, Germany, and Denmark have, by the adoption of the system of packing butter in hermetically sealed cans, each containing 1, 2, 3, 7, 14, or 24 pounds of butter, secured the entire or about the entire trade of supplying the ships of the world. I believe that the American creamery butter is eminently suitable for this particular branch of the export butter trade. If this butter were packed and sealed in cans similar to those exhibited by Mr. Clanchy, which preserve the butter fresh and sweet for a long period in any climate, immediately on being made at the creameries, nothing, so far as I can see, is to prevent its use in supplying the immense foreign shipping trade of our country. Whereas, all vessels going from Europe to America take with them a supply for the double voyage, it would be quite practicable, if this enterprise were introduced in the United States, to secure the entire trade for the American exporters. The United States ought to be able to compete most successfully with Europe for this trade, inasmuch as all dairy products can be produced so much cheaper with us than on this side of the Atlantic.

For the large passenger steamships the finest butter is utilized, and also for export to countries where the consuming population require and can afford to pay for it, such as India, Japan, China, Australia, and South America, and countries bordering on the Mediterranean.

For merchant shipping and for the poorer classes of the population in the above-named countries, a second and third quality of butter is good enough, and it is for the inferior qualities that the United States, as would appear from published market reports, require a greater outlet than for the products of the best dairies, inasmuch as the American markets are continually glutted with stock of this sort, chiefly owing to the inroads which the improved manufacture of butterine has made upon the markets hitherto available for the consumption of cheap genuine butter. Since the merchant vessels use chiefly butter of the third quality, it will be seen that the markets for large quantities of this class of butter might be found if the canning system were adopted for the supply now furnished, for the most part, by European exporters.

From a statement, herewith submitted, showing our butter exports for eleven years, 1874 to 1884, both inclusive, it appears that this export has increased nearly fivefold in quantity during that period. The price per pound was, however, nearly 7 cents greater in 1874 than in 1884. On turning to the butter import into the United Kingdom for those two years it is found that the average price per pound in 1874 was 24.24 cents, and for 1884 (omitting the import from Holland wherein imitation butter predominated) the average price was 24.70 cents per pound. Thus the decline, in value in American butter during the eleven years under consideration must have been wholly due to deterioration in quality. In this connection it should be remembered, however, that our first-class butter finds as good a market at home as in any foreign country, and it may be assumed that this fact alone accounts for the decline in the price of American export butter in 1884, as compared with the year 1874.

Our exports of butter to Europe during the eleven years increased nearly ninefold in quantity, this increase being wholly dominated by our exports to the United Kingdom and to Germany.

The export in 1884 of American butter to Denmark and Sweden (421,377 and 370,371 pounds respectively) is worthy of attention, being our first recorded butter exports to these countries.

It would be interesting to ascertain whether this product was imported into those butter-exporting countries for consumption or to be worked over for the English market. As the latter was more than likely the real purpose of import, it becomes a question for our dairy farmers whether, if it pays the Danish and Swedish butter makers or assorters to import American butter, manipulate it over and re-export the same to England at profitable prices, it would not pay them to so

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manipulate it in the first place as to leave nothing for foreign "butter doctors" to realize from any subsequent handling? If our butter can be so manipulated as to sell in London as Danish and Swedish butter, it must be, in its finished state, as good as Danish or Swedish butter, or the factors of those countries would not risk their good names by placing it before the British public with their brands thereon. It necessarily follows that our own dairy farmers can turn out our whole product for export of as good quality as either Danish or Swedish butter, if they only take the necessary time and care in all the details of manufacture.

It will be seen that our butter export to Canada (which is doubtless largely re-exported to Great Britain), the British West Indies, the French possessions in America, the Spanish West Indies, the United States of Colombia, and Venezuela, is of considerable volume and value. The fact that we export about one-half as much butter to countries on this continent as we do to Europe is significant, and as this field is capable of being largely developed it is worthy of the special attention of our dairy farmers.

In this connection it is to be assumed that canned butter, put up after the manner of Irish butter as reported by our consul at Cork, would be better suited for the West Indian and South American markets than our butter packed and shipped in its present form.

Our butter exports to Africa and Asia are, as might be expected, of little account. These continents do not consume butter in its American and general European form to any appreciable extent. To win any trade therein would require from our dairy farmers special preparation and special packing. The reports from these continents will enable those directly concerned to appreciate the conditions which are called for in this connection.

THE FOREIGN OLEOMARGARINE MARKET.

Exports of oleomargarine from the United States during the year 1884.

Exported to—	Imitation butter.		The oil.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	<i>Pounds.</i>		<i>Pounds.</i>		<i>Pounds.</i>	
Germany	30,790	\$2,605	90,551	\$11,806	127,341	
Holland			33,173,819	4,127,827	33,173,819	\$14,471
Belgium	1,520	175	2,804,263	358,798	2,805,783	4,127,827
United Kingdom	421,316	47,804	1,545,947	161,156	1,967,263	358,973
Canada	1,001,803	107,175	60,596	6,159	1,062,399	299,020
Denmark			32,614	4,200	32,614	113,314
Elsewhere	82,253	13,300	11,399	1,237	93,652	4,200
Total	1,537,682	171,119	37,785,159	4,671,243	39,322,841	4,842,362

Value per pound of oleomargarine exported in 1884.

Exported to—	Imitation butter.		The oil.	Exported to—	Imitation butter.	
	<i>Cents.</i>	<i>Cents.</i>			<i>Cents.</i>	<i>Cents.</i>
Holland	11.51	12.44	Canada		10.69	10.17
Belgium	11.51	12.53	Germany		8.46	12.30
United Kingdom	11.36	10.42	Denmark		16.32	10.85

The foregoing figures show that our exports of oleomargarine in 1884 were 18,695,467 pounds in quantity and \$1,091,591 in value greater than our exports of butter, and at prices only a little more than one-half the latter.

THE FOREIGN CHEESE MARKET.

Our annual cheese export amounts to over five and one-half times in quantity and three times in value our butter export, the export during the year 1884 amounting to 112,869,575 pounds, valued at \$11,663,713.

The imports of cheese into the United Kingdom, which cover the greater portion of the surplus cheese of the several countries, were as follows in 1884:

Imports of cheese into the United Kingdom during the year 1884.

Imported from—	Quantity.	Value.	Value per pound.
	Pounds.		Cents.
United States.....	100,333,280	\$12,062,353	11.024
Canada.....	65,991,544	7,273,301	11.021
Holland.....	55,777,392	4,342,002	12.137
France.....	3,030,650	438,600	14.443
Russia.....	394,800	40,218	11.714
Belgium.....	362,880	41,717	12.323
Australia.....	315,050	38,418	12.104
Sweden.....	278,880	30,340	10.883
Denmark.....	180,056	21,982	11.627
Germany.....	93,856	11,255	11.992
Elsewhere.....	63,168	8,728	15.400
Total.....	215,830,568	24,307,944	11.262

Considering the immense quantity of American cheese consumed in the United Kingdom—8,000,000 pounds at least of the imports from Canada, above recorded, being American cheese exported by and credited in British returns to the Dominion—it may be held that it stands as well in public estimation as the product from any other country, although the specially prepared cheese of some other countries bring higher prices in the market. These higher figures, however, in the case of Holland, cover only small quantities, comparatively. It may well be questioned whether the cheese of any other country, in quality and flavor, is superior to American cheese, but the latter still suffers, in price at least, for it does not seem to suffer in consumption from that lingering prejudice which regards all American products as in some mysterious manner inferior to the products of the older countries—a prejudice which has operated very unfavorably for our products, but which is being dissipated by the continuous good qualities of the products themselves.

It will be seen that we supply the British markets with a little more than one-half their total imports of cheese. Our exports of cheese to the United Kingdom during the year 1884, 102,686,547 pounds, and to Canada, 8,803,296 pounds—the greater portion of the latter going to England also—left only 1,879,632 pounds for export to all other countries. It will thus be seen that our foreign cheese trade may be said to be confined to the United Kingdom. Of our immense cheese export during 1884, only a little over 3,000 pounds went to all Europe, outside the United Kingdom.

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This branch of our dairy industry calls for no further comment. Our dairy farmers have only to continue to supply the British markets, as heretofore, with good cheese, to maintain the trade at its present magnificent proportions. It may be time to consider, in addition to our manufacture of cheese for general consumption, whether it would not pay to cater to particular and peculiar taste. For instance, French cheese to the amount of over 3,000,000 pounds, valued at over 3 cents per pound more than American cheese, was consumed in the United Kingdom in 1884. Even Dutch cheese, imported to an amount equal to one-third of the total imports of the United States (35,777,392 pounds), is valued at more than 1 cent per pound higher than American cheese by the British customs. Our cheese manufacturers should study the modes of manufacture in the several countries, especially in France, Holland, Switzerland, and Italy, and learn therefrom, if there is anything to be learned, the secrets of special-cheese making. The reports from those countries will be found full and valuable aids to such study.

Our cheese manufacturers should never lose sight of the fact that whenever, without any depreciation in the quality, they can export cheese to the United Kingdom at lower prices than are obtained at present, the result will be an increase in the consumption of this product. Indeed, it would be hard to estimate the increased consumption of American cheese which would result from a decrease of even a penny per pound in the United Kingdom. Of course this principle applies to all other food supplies equally as well as to cheese, and it should always be borne in mind and worked up to by our producers and exporters without waiting for competition to reduce the price.

CANNED AND SALTED BEEF, BEEF TALLOW, ETC.

The foregoing statistics, covering the foreign trade and our present and prospective share therein, in horned cattle, fresh beef, butter, cheese, and oleomargarine, still leave canned and salted beef, beef tallow, and condensed milk before the subject of cattle and cattle products, in this connection, is exhausted.

The details of our trade herein will be found in the tabulated statements immediately following this letter, showing our total exports of cattle and cattle products, by countries and continents, for the year 1884.

Our exports of canned beef for the year 1884 amounted to \$3,173,767, of which the United Kingdom took to the value of \$2,542,122, while less than \$300,000 worth went to the remainder of Europe.

Our exports of beef tallow during the year 1884 amounted to 63,091,103 pounds, valued at \$4,793,375. In 1880 our exports of tallow amounted to \$110,707,627 pounds, valued at \$7,689,262. Of course this showing does not go to prove any decrease in this product during those five years, for it is too apparent that beef tallow in our market must keep pace with the slaughter of cattle, and the latter having increased very largely during the years under review, it follows that the falling off in our export of the former is wholly due to an increased home consumption. This increased consumption is in the line of oleomargarine manufacture, and our exports of the latter, together with our home consumption thereof, will fully cover any decrease in the export of beef tallow.

Of the total tallow export of 1884, 57,706,979 pounds, valued at \$4,339,322, went to Europe, of which much more than one-half went to the United Kingdom, France (8,514,000 pounds), Belgium, and Holland following in their respective order.

Value per
pound.

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353	11.624
301	11.921
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000	14.443
248	11.714
717	12.323
418	12.104
340	10.883
982	11.627
255	11.962
728	15.400
944	11.262

Our total exports of salted beef in 1884 amounted to 42,379,911 pounds, valued at \$3,202,275, of which 31,410,557 pounds, valued at \$2,410,557, went to Europe; 9,652,769 pounds, valued at \$708,934, to countries in America; and 313,200 and 227,390 pounds to Asia and Africa, respectively. The United Kingdom took the principal portion of this product, as of all the other cattle products reviewed, oleomargarine excepted, no less than 26,831,030 pounds, valued at \$2,058,383, going thither.

Our total exports of cattle and cattle products during the year 1884 were as follows:

Designation.	Quantity.	Value.	Designation.	Quantity.	Value.
Cattle number	190,518	\$17,855,405	Cheese pounds	112,869,575	\$11,663,713
Fresh beef pounds	129,784,064	11,987,331	Beef tallow do.	63,091,193	4,793,375
Canned beef do.		3,178,707	Oleomargarine do.	39,322,894	4,842,392
Salted beef pounds	42,379,911	3,202,275	Condensed milk do.		263,008
Other beef do.	641,163	67,758	Total		61,544,853
Butter do.	20,027,374	9,750,771			

CATTLE-BREEDING IN FOREIGN COUNTRIES.

As remarked at the beginning of this letter, those portions of the consular reports which deal with the many-sided, and, it may be added, finely-shaded subject of cattle-breeding in the various countries, the cattle most suitable for export to the United States, the best modes and routes of imports hitherto, the various phases of dairy farming, &c., do not adapt themselves to statistical analyses in any more condensed forms than those given in the various reports themselves; hence, these portions of the general subject are left untouched.

As was to be expected from the nature of the interests involved and the conditions by which they are surrounded, many of the consular reports treat of the same breeds of cattle, and many seem to have the appearance of repetition. Care has been taken, however, to guard against such repetition, while, at the same time, giving due consideration to the efforts and labors of the consuls. Regard for consular efforts is, however, herein conserved by regard for the general interests involved, for the various reports, treating of the same breeds of cattle and their relative merits, give a many-sided view of the same subject, and hence serve to modify and correct each other; for the admirers of special breeds, without intending to be partial, are sure to paint their favorites in colors too glowing. Hence the wisdom, as well as utility, of giving the reports in full, leaving the intelligent cattle-breeders of the United States to draw their own conclusions therefrom.

One of the most interesting parts of the whole subject of cattle-breeding is that relating to cross-breeding and its results in the several countries. In this connection, as well as in helping to show the modifications and shadings which change of countries, or districts within countries, has effected on what are called pure-bred cattle and on the cattle bred from intermixture of the native breeds therewith, the illustrations which accompany the reports will greatly aid the stock-breeders of the United States in arriving at correct conclusions and immediate results—results which, it should be remembered, have been attained in the Old World only by slow, patient, and costly effort; indeed, the whole experience of Europe is herein laid open to our cattlemen and dairy farmers.

As there is no portion of this vast subject which has produced more heated discussion and honest difference of opinion among those directly

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concerned than the wisdom or otherwise of getting what some of our consuls call "fancy-stock crazed," and paying more for a single "blooded" animal than a well-stocked moderate farm is usually worth, and as many of these reports, principally those which treat of the fine and noted breeds in the United Kingdom, are undoubtedly calculated to incite the enthusiasm of American cattlemen, a paper from Consul Tanner, of Liège, Belgium, which is, in part, an argument, supported by valuable statistics, against such enthusiasm, and intended to prove that our farmers can, by selection and care, develop a race of American cattle equal to any so-called "blooded stock," has been inserted as a prelude to the general reports. Such facts as that our cattle are now the best foreign cattle slaughtered for the British market, and the evidence given before the Ontario agricultural commission by a leading cattle exporter, that the Western cattle of the United States "are far superior to Canadian grain-fed cattle, there being no comparison between them," should be remembered in this connection.

Without desiring to advocate or combat the views herein set forth, feeling well assured that the cattle-breeders of the United States are fully competent to read and digest the matter contained in these reports, I cannot help feeling that many of the latter are calculated to arouse a certain amount of enthusiasm where only the coolest calculation is called for. In this regard Consul Tanner's paper on "Cattle-breeding in Europe and in the United States," with its mass of valuable European opinion, methods of feeding, breeding for show and for sale, principally to American cattlemen, will at least serve to moderate those reports written, or incited, by breeders of "blooded stock," who, naturally enough, write lovingly of their favorites.

Given that full consideration and calm deliberation which American cattle-breeders and dairy farmers are surely capable of giving to such a congenial subject as cattle-breeding and dairy-farming, these reports, together with the statistics attached thereto in a supplementary form, contain, it is confidently believed, a mass of information such as has never before been compiled and published in any country, and must prove of great value to the cattlemen and dairy farmers of the United States.

I have the honor to be, sir, your obedient servant,

T. F. BAYARD.

Hon. JOHN G. CARRISLE,
Speaker of the House of Representatives.

Tabulated statements accompanying the Secretary's letter.

Cattle statistics:

- (1) Statement showing the exports of cattle from the United States during the eleven years ending with the year 1884, showing the numbers and total value and the value per head of the cattle exported to each country.
- (2) Statement showing the imports of cattle into the United Kingdom during the eleven years ending with the year 1881, showing the number and total value and the value per head of the cattle imported from each country.

Fresh beef statistics:

- (3) Statement showing the exports of fresh beef from the United States from the year 1877 (the first officially recorded year of its export) to and including the year 1884, showing the quantity and total value and the value per pound of the exports to each country.
- (4) Statement showing the imports of fresh beef into the United Kingdom during the eleven years ending with the year 1881, showing the quantity and total value and the value per pound of the imports from each country.

Butter statistics:

- (5) Statement showing the exports of butter from the United States during the eleven years ending with the year 1884, showing the quantity and value of the exports to each continent and country therein.
- (6) Statement showing the imports of butter and oleomargarine into the United Kingdom during the eleven years ending with the year 1881, showing the quantity and total value and value per pound of the imports from each country.

Cheese statistics:

- (7) Statement showing the exports of cheese from the United States during the eleven years ending with the year 1881, showing the quantity and value of the exports to each continent and country therein.
- (8) Statement showing the imports of cheese into the United Kingdom during the eleven years ending with the year 1881, showing the quantity and total value and the value per pound of the imports from each country.

General statistics:

- (9) Statement showing the exports from the United States of cattle and cattle products—horned cattle, fresh beef, canned beef, salted beef, other beef, butter, cheese, beef tallow, and oleomargarine—during the year 1884, showing the number, quantity, and value of the several products exported to each country.

I.—Statement showing the exports of cattle from the United States during the eleven years ending with the year 1884.
a.—Number of cattle exported in each year.

Exported to—

1874.

1875.

1876.

CATTLE AND DAIRY FARMING.

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I.—Statement showing the exports of cattle from the United States during the eleven years ending with the year 1884.
a.—Number of cattle exported in each year.

Exported to—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
United Kingdom.....	123	110	214	5,091	24,982	71,794	123,742	134,361	68,008	76,091	104,227
Canada.....	6,357	5,318	8,629	12,617	14,777	14,577	2,810	1,978	2,801	3,825	3,825
British West Indies.....	1,306	1,338	1,580	1,741	1,574	3,531	2,499	1,978	1,529	1,174	1,133
Mexico.....	11,515	12,018	6,345	2,809	964	40,345	40,345	1,254	1,529	1,174	1,133
Cuba.....	26,461	37,686	34,493	27,338	40,172	40,345	40,345	38,911	34,606	20,754	8,015
Germany.....	305	341	93	335	1,171	1,326	45,517	297	0	754	323
France.....	56,007	57,211	51,502	50,001	389	2,019	4,016	1,297	110	728	250
Total.....					80,040	136,720	182,756	183,707	108,110	104,444	190,513

b.—Total value of cattle exported in each year.

United Kingdom.....	\$113,600	\$73,000	\$31,220	\$346,820	\$2,408,813	\$6,616,114	\$11,547,742	\$12,993,283	\$9,960,600	\$7,602,244	\$17,356,616
Canada.....	164,051	136,682	304,804	380,253	119,517	518,165	92,943	132,362	124,144	146,845	96,529
British West Indies.....	107,460	131,993	142,908	147,632	119,517	101,224	132,279	137,324	113,430	95,714	96,529
Mexico.....	95,514	111,930	66,733	27,952	8,109	21,328	10,672	13,734	18,602	47,492	128,689
Cuba.....	636,654	585,980	561,188	432,967	683,863	717,326	703,054	537,936	548,301	366,602	115,024
Germany.....	32,472	23,548	11,579	41,439	87,618	117,860	133,370	16,809	10,000	20,269	20,269
France.....	1,150,857	1,103,065	1,110,792	1,593,080	109,187	214,356	401,275	129,520	22,421	82,421	10,247
Total.....					3,800,818	8,379,200	13,344,195	14,304,103	7,600,227	8,341,431	17,855,495

c.—Value per head of cattle exported to each country.

United Kingdom.....	\$225.20	\$663.64	\$290.18	\$107.41	\$98.02	\$92.15	\$94.22	\$96.72	\$102.35	\$99.91	\$102.43
Canada.....	23.09	29.37	34.52	34.52	40.05	60.57	62.73	29.32	44.32	38.25	27.57
British West Indies.....	82.29	83.12	90.64	83.45	73.43	68.08	62.73	67.49	75.51	81.25	87.19
Cuba.....	17.47	13.54	16.36	16.06	17.02	9.82	10.73	10.96	23.49	25.71	13.69
Germany.....					81.63	87.86	15.46	13.50	15.85	17.61	13.69
France.....					91.60	100.00	109.17	90.63	90.91	92.43	92.43

* The exports of cattle to the United Kingdom in 1874 are entered as follows in the official returns: To England, 18 head, valued at \$5,850 per head, \$103,900; to Scotland, 103 head, valued at \$20.50 per head, \$2,111.50. The 18 head of cattle exported to England were evidently some very fancy stock, exported for breeding purposes.

11.—Statement showing the importations of cattle (oxen and bulls) into the United Kingdom during the eleven years ending with the year 1891.

a.—Number of cattle imported in each year.

Whence imported.		1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
	Sweden	7,100	3,673	5,004	4,077	6,501	6,790	7,544	9,816	13,103	17,079	14,426
	Norway	1,010	2,552	26,595	21,694	29,385	21,628	24,477	34,554	49,899	60,534	47,747
	Denmark	17,052	59,031	51,616	33,704	28,832	29,367	35,377	29,887	29,182	17,310	21,501
	Germany	19,889	27,196	20,708	13,085	8,672	1,637	5,081	4,630	13,877	3,905	2,501
	Belgium	1,180	6,721	372	382	.....	.....	.....	.....	.....	.....	.....
	France	2,284	8,908	4,559	2,858	356	200	1,445	1,495	13,600	3,267	.....
	Portugal	12,482	13,924	13,924	14,047	14,566	14,566	10,727	16,629	31,739	21,866	17,403
	Spain	16,580	25,853	20,786	27,678	62,308	55,931	156,490	102,650	47,664	54,982	139,213
	United States	.....	.....	.....	17,578	17,925	25,079	47,215	43,359	32,114	53,694	59,054
	Canada	.....	.....	.....	4,359	17,925	25,079	47,215	43,359	32,114	53,694	59,054
	All other	273	1,212	2,635	76	.....	.....	88	264	187	85	136
	Total	120,158	174,236	168,958	148,018	197,111	186,468	317,408	251,622	264,316	367,602	360,696

b.—Value of cattle imported during each year.

Saudi Arabia	\$623,744	\$681,024	\$726,105	\$137,633	\$771,170	\$557,131	\$684,250	\$655,155	\$1,452,815	\$1,739,650	\$1,493,260
Switzerland	97,936	29,981	5,950	9,419	64,706	67,777	76,594	60,730	51,539	82,703	141,408
Norway	1,627,235	2,756,249	3,337,890	571,219	2,637,432	1,995,383	3,290,490	3,333,990	4,853,140	5,224,740	4,160,100
Denmark	4,109,130	5,291,096	5,437,986	642,194	3,513,215	2,418,468	2,605,502	3,329,378	3,620,142	5,924,750	1,187,500
Holland	1,972,188	2,752,704	2,611,410	1,349,904	2,845,619	1,743,831	4,095,776	4,330,522	1,831,718	588,398	247,899
Belgium	134,902	801,320	831,836	4,774	43,534	35,904	392,186	394,566	1,919,018	412,158	
France	255,648	1,220,018	649,296	415,512	1,622,734	1,016,368	1,714,916	2,396,538	2,982,556	1,466,240	
Portugal	1,587,638	2,529,410	1,572,210	1,649,191	2,049,208	1,411,116	1,387,080	2,813,586	2,138,650	1,589,290	
Spain	1,137,065	2,138,440	1,828,818	2,373,793	2,049,208	3,661,492	17,858,472	5,330,290	17,191,764	16,139,600	
United States*	43,740	1,522,062	1,522,062	1,468,793	1,585,394	2,654,582	4,933,818	4,094,660	3,443,562	6,137,600	
All other countries	26,720	210,924	345,496	928,366	1,917,394	2,654,582	4,933,818	4,094,660	3,443,562	21,748	
All other				10,023			12,438	23,105	28,072	25,143	
Total	11,620,261	18,176,154	17,268,893	13,700,660	17,974,772	19,838,094	34,005,420	26,609,472	27,290,500	38,531,276	33,100,946

C.—Value per head of the cattle imported in each year.

Sweden	\$36 31	\$103 73	\$105 13	\$109 22	\$118 55	\$112 49	\$97 16	\$96 90	\$96 90	\$97 32
Norway	86 32	92 43	77 27	57 50	87 93	97 20	93 60	95 06	95 06	95 06
Denmark	91 67	91 80	91 92	90 80	90 45	91 70				
Germany	98 06									

c.—Value per head of the cattle imported in each year.

	\$86 31	\$103 73	\$105 12	\$109 22	\$112 53	\$112 49	\$97 16	\$93 90	\$96 22	\$96 65	\$97 32
Sweden.....	86 32	92 43	77 37	90 50	97 29	87 92	97 20	93 60	96 22	96 65	97 32
Norway.....	91 67	91 86	91 62	90 80	97 29	91 19	94 30	98 54	97 24	98 06	97 08
Denmark.....	96 06	103 73	105 89	120 66	125 52	104 78	102 96	98 19	107 18	107 77	97 00
Holland.....	109 16	109 48	98 90	90 04	97 51	104 69	97 77	98 89	107 77	109 70	96 74
France.....	103 08	136 89	142 42	144 92	132 31	124 09	114 37	120 62	120 86	125 38	96 74
Portugal.....	103 08	140 31	112 91	113 10	115 82	113 04	114 37	120 62	120 86	125 38	96 74
Spain.....	90 90	140 31	87 98	87 00	91 82	86 48	88 15	103 48	100 46	103 93	104 94
United States.....	146 20	146 20	136 72	127 46	118 68	113 53	114 32	103 48	100 46	103 93	104 94
Canada.....	97 90	174 63	139 15	126 78	104 28	103 85	104 07	105 83	107 25	111 92	90 91
Total average*.....	57 29	104 32	101 99	106 05	112 97	106 12	107 17	105 74	103 28	104 81	106 83

* In 1878 the imports of American cattle began to be felt in the British markets; after that year they dominate the general prices.

III.—Statement showing the exports of fresh beef from the United States from the year 1877, the first year of any recorded export thereof, to the year 1884, both years inclusive.

a.—Quantity exported in each year.

Exported to—	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
United Kingdom.....	Pounds. 44,210,990	Pounds. 53,540,469	Pounds. 52,792,969	Pounds. 84,434,881	Pounds. 103,322,477	Pounds. 68,372,941	Pounds. 79,070,842	Pounds. 115,601,677
France.....	.....	484,680	167,502	191,322	2,598,507	4,180,253	1,705,982	5,699,161
Canada.....	.....	12,532	3,420	70,951	59,828	23,272	290,549	154,846
Elsewhere.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	49,210,990	54,046,711	54,025,832	84,717,134	106,004,812	69,586,466	81,064,373	120,764,161

b.—Value of the exports for each year.

United Kingdom.....	\$4,552,523	\$5,008,122	\$4,776,572	\$7,471,235	\$9,652,563	\$6,329,449	\$4,160,769	\$11,516,369
France.....	.....	42,537	98,834	10,253	201,057	435,435	141,932	455,003
Canada.....	.....	1,167	342	6,378	6,679	3,897	36,380	17,935
Elsewhere.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	4,552,523	5,000,836	4,883,680	7,441,918	9,860,284	6,768,881	8,342,131	11,987,331

c.—Value per pound for each year.

United Kingdom.....	Cents. 9.55	Cents. 9.39	Cents. 9.45	Cents. 8.81	Cents. 9.31	Cents. 9.68	Cents. 10.32	Cents. 9.96
France.....	.....	8.72	4.80	5.37	7.75	10.41	8.51	9.05
Canada.....	.....	9.30	10.00	8.99	11.16	12.01	12.52	10.57
Elsewhere.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	9.25	9.29	9.64	8.77	9.30	9.73	10.29	9.92

IV.—Statement showing the imports of fresh beef into the United Kingdom during the eleven years ending with the year 1884.

a.—Total quantity imported in each year.

IV.—Statement showing the imports of fresh beef into the United Kingdom during the eleven years ending with the year 1884.
a.—Total quantity imported in each year.

Imported from—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
United States	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds.
Canada	122,650	346,496	10,164,512	49,620,704	51,127,744	62,089,760	81,118,464	83,751,920	50,083,136	81,868,102	90,904,128
Russia	23,424	23,424	71,336	2,292,160	2,067,468	933,702	182,000	6,753,440	.....	3,882,512	2,643,872
Germany .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,551,184
Australia	3,650,784	3,107,112	2,414,068	252,836	620,392	46,704	13,120	500,458	1,454,344	1,615,452	1,615,452
France .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	170,404
Elsewhere .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	301,648
Total .....	.....	.....	143,560	301,998	173,962	.....	132,220	922,592	466,702	29,436	304,272
.....	.....	.....	18,794,016	52,515,544	50,966,384	63,690,256	81,467,804	91,537,040	51,962,848	94,136,028	98,375,200

b.—Total value of the imports for each year.

United States	\$12,714	\$40,811	\$1,893,456	\$5,851,440	\$6,215,040	\$7,290,840	\$9,142,080	\$9,611,280	\$9,098,064	\$10,006,740	\$10,724,579
Canada .....	.....	4,165	8,991	231,859	227,768	167,572	20,076	844,902	291	457,900	320,531
Russia .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	261,792
Germany	270,516	356,578	265,356	30,424	78,246	5,939	2,012	58,893	170,464	208,503	39,409
Australia .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29,363
France .....	.....	.....	.....	64,385	.....	.....	.....	.....	.....	.....	32,843
Elsewhere .....	.....	.....	17,257	3,927	20,777	.....	18,919	56,602	66,243	4,748	17,593
Total .....	.....	.....	2,185,690	6,202,445	6,544,751	7,374,321	9,184,088	10,574,757	9,275,062	10,998,173	11,553,480

c.—Price per pound in each year.

United States	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
Canada	10.36	11.76	11.49	11.77	11.11	11.58	11.27	11.48	12.66	12.22	11.80
Russia .....	.....	16.14	12.60	11.26	11.64	11.27	11.63	11.56	11.35	12.44	12.12
Germany .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.12
Australia	10.31	11.45	10.59	12.04	12.59	12.03	13.31	11.56	11.71	12.91	12.56
France .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16.06
Elsewhere .....	.....	.....	12.00	17.79	11.81	.....	12.32	11.40	14.19	13.19	10.64
Total .....	.....	.....	11.63	11.81	11.46	11.53	11.27	11.55	12.08	12.19	11.74

CATTLE AND DAIRY FARMING.

V.—*Exportation of butter from the United States for eleven years, 1874-1884.*

Whether exported.									
1874.		1875.		1876.		1882.		1884.	
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
To Europe:									
<i>Pounds.</i>		<i>Pounds.</i>		<i>Pounds.</i>		<i>Pounds.</i>		<i>Pounds.</i>	
Belgium	84,208	73,850	\$14,715	38,147	\$7,444	1,420	\$290	17,656	\$2,973
France	15,183	2,441	31,815	118,586	9,749	118,586	25,250	13,794	13,794
Germany	148,889	27,424	36,888	8,210,578	884,735	884,735	132,827	418,339	418,339
The United Kingdom	1,378,890	304,191	3,265,360	719,169	3,727,971	4,571,362	904,965	1,816,311	1,816,311
Gibraltar		470	122	11,678	1,917				
Holland		750	48,367	6,388					
Portugal		2,853	750	48,367	6,388				
Sweden and Norway	9,201	1,639	42	639	189	100	17	370,371	55,680
Denmark								421,377	60,005
Total to Europe	1,538,263	339,913	771,786	33,203,367	4,638,403	5,807,461	1,067,259	13,318,568	2,428,703
To America:									
Argentine Republic	21,670	5,303	500	990	30	108,770	38,915	2,040	400
Brazil	17,100	5,101	12,573	174,011	38,815	108,770	38,915	2,040	400
Canada	285	125	16,646	36,616	4,322	37,701	9,313	53,434	13,046
Chili				1,500	249			6,354	1,339
Danish West Indies	107,171	26,450	68,921	59,740	24,094	152,838	27,877	161,714	25,110
French possessions	56,289	11,248	49,793	90,447	332,907	332,907	54,036	27,482	27,482
Guatemala	426,310	397,623	94,813	834,371	102,061	1,257,651	197,365	87,492	87,492
Haiti	694,363	160,630	167,251	1,346,270	181,791	1,346,270	348,472	1,205,575	20,155
British West Indies	16,493	5,885	2,274	53,242	10,319	44,897	14,019	68,407	13,689
British Guiana									
Colombia	6,769	19,191	16,265	69,017	15,891	124,913	30,470	102,460	23,435
Cuba	161,291	26,794	31,925	162,572	25,741	173,630	34,723	173,685	30,841
Dutch possessions	19,597	7,527	2,328	10,917	2,585			13,156	2,301
Peru	48,004	27,997	68,980	69,607	17,354	112,068	21,676	132,252	23,654
San Domingo	269,371	75,794	279,601	333,677	49,998	411,168	73,983	348,816	63,054
Hawaii	436,316	113,216	595,476	638,028	83,800	306,588	49,864	471,688	71,407
Spanish West Indies	207,706	92,487	183,501	203,063	53,144	203,063	53,144	203,063	53,144
United States of Colombia	59,580	29,158	33,158	203,152	38,559	583,675	80,896	368,037	70,595
Venezuela									
Total to America	2,666,401	703,213	2,613,833	4,602,327	6,021,940	6,021,940	1,112,940	6,021,940	1,234,324
Total to Europe									
To Asia:									
China	17,294	3,709	4,960	1,858	6,782	12,064	3,480	15,089	3,514
Hong-Kong	1,140	369			2,512	27,524			1,809

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Total to-day . . .

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To Asia:		2,666,461	703,213	2,613,833	672,653	4,602,927	671,327	6,024,940	1,112,940	6,924,034	1,234,323
China:		17,296	5,769	4,360	1,858	25,517	6,782	12,064	3,480	15,689	3,514
Hongkong:		1,140	369			9,258	2,532	27,624	6,558	8,169	1,809
Total to America:											
Japan:		67,052	24,116	53,865	19,755	163,937	24,344	93,675	22,460	140,243	10,124
Russia in Asia:		26,701	7,664	73,807	18,863	8,530	2,069	6,263	1,394	4,566	1,158
Total to Asia:		107,002	37,869	134,632	40,466	140,292	35,707	133,479	32,768	118,027	25,605
To Africa:											
British Africa:		11,438	3,481	23,199	7,865	75,419	18,897	9,588	2,593	54,020	9,619
Liberia:		4,869	1,732	4,528	1,497	1,362	441	1,341	280	2,104	619
Spanish Africa:		250	1,258	729	207	369	87	1,140	245	100	18
Total to Africa:		16,897	5,291	28,750	9,569	77,050	19,336	12,069	3,018	56,320	10,479
Not designated:		19,339	6,104	76,588	12,510	223,446	56,492	391,735	77,660	210,425	51,460
Grand total:		4,307,982	1,092,361	6,360,627	1,506,906	3,246,016	5,421,205	12,348,641	2,290,665	20,627,374	3,750,771

VI.—Statement showing the imports of butter into the United Kingdom during the eleven years ending with the year 1884, oleomargarine included.

a.—Total quantities imported during each year.

Imported from—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
Sweden	2,608,684	3,128,014	3,294,144	4,317,040	4,383,456	5,720,562	7,989,220	7,414,736	7,595,952	10,850,980	11,404,064
Norway	16,496	11,178	13,488	13,188	1,215,536	1,991,248	3,502,376	2,811,168	1,219,360	2,424,912	3,489,472
Denmark	25,317,936	23,091,152	22,991,840	23,536,004	27,151,824	31,534,880	33,617,912	3,385,060	31,128,967	39,091,408	37,527,504
Germany	13,123,024	12,194,336	12,539,736	16,915,952	12,828,736	12,889,600	12,193,080	12,193,080	12,685,344	13,063,800	16,177,280
Holland	39,379,760	39,695,872	45,131,208	41,679,060	51,867,312	71,418,224	90,777,008	87,479,872	103,172,384	110,174,000	128,524,128
Belgium	8,392,976	8,944,400	7,314,608	6,518,400	8,468,176	7,069,360	5,966,008	6,131,168	6,469,504	56,968,480	37,121,712
France	23,664,720	23,664,720	23,664,720	23,664,720	23,664,720	23,664,720	23,664,720	23,664,720	23,664,720	23,664,720	23,664,720
United States	5,629,324	5,629,324	5,629,324	5,629,324	5,629,324	5,629,324	5,629,324	5,629,324	5,629,324	5,629,324	5,629,324
New South Wales	93,432	93,432	93,432	93,432	93,432	93,432	93,432	93,432	93,432	93,432	93,432
Elsewhere	658,788	618,634	542,960	939,113	1,239,026	1,110,455	2,096,464	1,540,332	608,624	1,196,328	598,460
Total	181,418,490	164,401,440	185,683,104	189,389,136	201,209,904	229,084,688	280,546,160	229,302,102	243,019,704	261,400,976	277,243,832

b.—Total value of imports during each year.

Sweden	\$671,106	\$776,142	\$808,614	\$1,153,586	\$1,143,538	\$1,419,686	\$2,009,376	\$1,870,128	\$1,910,952	\$2,084,758	\$2,887,384
Norway	16,496	11,178	13,488	13,188	1,215,536	1,991,248	3,502,376	2,811,168	1,219,360	2,424,912	3,489,472
Denmark	6,624,904	6,290,854	6,375,376	6,536,306	7,352,052	8,138,210	8,637,192	8,222,664	8,106,992	9,294,284	9,190,256
Germany	3,725,802	3,439,354	3,292,680	2,875,204	2,179,168	1,931,166	1,831,304	18,295,664	20,950,488	20,431,996	24,283,576
Holland	9,360,176	9,415,994	9,604,994	10,877,570	13,439,514	15,041,292	14,729,262	11,283,016	1,496,202	1,274,592	1,748,848
Belgium	15,168,816	16,481,792	18,139,464	17,769,870	15,431,398	11,009,077	13,727,276	13,293,371	15,754,176	13,702,548	14,077,520
United States	917,417	1,000,674	2,898,400	4,474,195	4,834,168	6,041,460	6,528,924	4,107,186	1,218,881	2,732,778	2,170,882
Canada	1,308,796	1,832,912	2,504,536	1,574,408	1,423,008	2,320,560	2,673,972	1,871,100	1,041,498	1,254,060	1,243,028
New South Wales	17,010	1,020	183,237	204,090	235,963	183,008	407,153	230,170	154,733	35,024	35,024
Elsewhere	143,438	295,720	183,237	204,090	235,963	183,008	407,153	230,170	154,733	35,024	35,024
Total	43,953,121	41,320,728	47,230,553	46,586,393	48,376,637	50,444,132	59,065,425	52,809,499	55,165,416	57,221,314	60,901,191

c.—Value per pound of the imports for each year.

Sweden	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
Sweden	22.77	24.41	25.28	26.80	26.09	26.09	26.09	26.09	26.09	26.09	26.09
Norway	26.05	26.35	26.01	26.01	26.01	26.01	26.01	26.01	26.01	26.01	26.01
Denmark	24.85	24.85	24.85	24.85	24.85	24.85	24.85	24.85	24.85	24.85	24.85
Germany	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11
Holland	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11
Belgium	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11
United States	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11
Canada	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11
New South Wales	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11
Elsewhere	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11
Total	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11	18.11

VI.—Statement showing the imports of butter into the United Kingdom, &c.—Continued.

c.—Value per pound of the imports for each year.—Continued.

Imported from—

c.—Value per pound of the imports for each year.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
Sweden	Cents. 22.73	Cents. 24.81	Cents. 27.28	Cents. 23.80	Cents. 26.09	Cents. 24.81	Cents. 25.04	Cents. 25.22	Cents. 25.16	Cents. 24.85	Cents. 25.37
Norway	26.05	26.33	26.01	23.07	13.03	18.21	17.35	20.29	18.69	18.11	17.55

VI.—Statement showing the imports of butter into the United Kingdom, &c.—Continued.

c.—Value per pound of the imports for each year—Continued.

Imported from—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
Denmark.....	Cents. 24.59	Cents. 23.35	Cents. 27.75	Cents. 27.80	Cents. 27.19	Cents. 28.80	Cents. 25.66	Cents. 26.25	Cents. 26.35	Cents. 26.41	Cents. 26.81
Germany.....	24.57	25.65	26.25	26.36	25.71	25.74	23.40	21.55	21.49	20.68	20.81
Holland.....	23.15	22.39	27.26	24.31	25.50	20.43	21.82	21.81	20.30	20.40	19.44
Belgium.....	26.35	26.97	27.59	28.19	27.09	26.93	21.82	21.81	22.87	22.47	20.00
France.....	23.33	25.89	26.02	23.16	24.85	22.43	23.05	23.74	21.44	23.76	24.04
United States.....	22.56	24.27	21.38	21.19	19.72	17.92	20.98	21.04	21.22	20.30	19.41
Canada.....	23.53	22.12	22.08	21.19	18.95	18.68	21.70	20.22	21.29	20.02	20.02
Australia.....	18.08	16.56	.....	15.69	15.14	16.09	12.56	16.11	22.13	20.51	18.47
Total.....	24.24	25.13	25.42	25.29	24.04	23.02	22.65	23.03	22.69	21.89	21.39

CATTLE AND DAIRY FARMING.

VII.—Statement showing the exports of cheese from the United States for eleven years.

Exported to—	1874.		1875.		1879.		1883.		1884.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Pounds.		Pounds.		Pounds.		Pounds.		Pounds.	
The continent of Europe:										
Belgium.....	2,500	\$284	113,964	\$14,911	19,183	\$1,643	9,461	\$1,697	3,888	\$440
France.....	18,019	2,550	27,273	3,454	27,273	2,400	185,713	17,117	79,661	2,968
Germany.....	10,382,028	1,417,810	8,526,648	1,084,086	410,827	33,740	12,122,099	10,210,454	102,686,547	10,598,526
The United Kingdom.....	78,552,976	10,213,178	89,817,648	12,199,030	136,600,368	1,721	91,582,055	76	113	15
Gibraltar.....	900	100			1,310	31				
Holland.....			60,000	9,000			1,025			
Russia.....	6,015	1,008								
Spain.....	39,486	6,427	4,630	605	250	25	188	29		
Total to Europe.....	89,001,914	11,661,227	98,622,319	13,397,692	137,059,922	12,160,155	91,778,462	10,229,273	102,770,209	10,511,767
The continent of America:										
Brazil.....	3,434	547	1,284	180	5,102	663	1,202	148	570	96
Central American States.....	14,625	2,317	29,415	3,454	21,932	2,190	26,046	3,882	30,940	4,300
Danish West Indies.....	25,355	3,138	29,697	3,043	59,582	4,630	31,055	4,093	42,360	4,333
French possessions.....	2,313	502	29,479	81	39,777	3,275	13,012	1,857	3,992	491
Germany.....	235,234	41,734	1,369,235	198,290	2,876,405	231,066	5,786,012	682,719	8,303,396	995,290
British West Indies.....	108,600	16,808	173,515	27,417	271,778	38,476	533,913	74,553	841,108	94,318
British Guiana.....	149,200	20,868	173,673	13,666	211,778	21,485	52,653	4,474	52,038	24,302
British Honduras.....										
Haiti.....	168,000	18,808	68,515	17,001	91,502	12,135	65,370	10,646	43,591	6,615
Mexico.....	27,499	4,810	23,462	4,381	68,738	8,335	67,308	11,193	59,267	9,965
Dutch possessions.....	22,998	4,068	6,819	964	5,540	689	7,183	1,118	7,149	1,042
Pern.....	650	60	150	49						
San Domingo.....	36,651	6,464	38,817	7,352	31,636	4,425	57,229	9,455	68,447	9,387
Spanish West Indies.....	280,369	36,069	289,323	43,198	347,091	39,669	288,008	40,487	285,269	45,608
United States of Colombia.....	3,689	3,818	36,437	5,454	34,576	4,462	131,560	17,291	210,013	30,791
Venezuela.....	24,198	3,689	10,362	1,854	6,728	817	13,542	2,530	13,013	2,354
Total to America.....	1,539,124	225,646	2,305,844	326,544	4,362,766	393,225	7,276,985	870,871	9,905,886	1,123,536
The continent of Asia:										
China.....	28,567	5,012	21,632	3,820	32,877	4,616	21,928	3,496	34,027	3,668
Hong-Kong.....	11,498	390	14,360	2,588	28,977	3,857	27,462	3,855	34,459	4,168
Japan.....	29,723	4,979	41,853	7,813	34,914	4,694	32,918	5,301	22,322	3,680
Russia in Asia.....	2,862	436	3,110	462			55		1,276	253
Total to Asia.....	72,590	10,777	80,955	14,690	96,768	13,207	82,350	12,709	82,064	12,717

The continent of Africa:

British Africa.....

Spanish Africa.....

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Total to America	1,339,124	229,646	2,339,844	4,362,766	394,229	7,216,683	870,871	9,805,868	1,121,536
The continent of Asia:									
China	28,567	5,012	21,632	3,830	4,616	21,923	3,498	34,027	3,692
Hong Kong	11,498	360	14,360	2,568	3,897	27,162	3,855	34,459	5,168
Japan	29,723	4,979	41,453	7,815	4,694	32,918	5,301	22,322	3,630
Russia in Asia	2,602	426	3,110	462	.....	242	55	1,276	233
Total to Asia	72,590	10,777	80,935	14,680	12,207	82,250	12,709	82,064	12,717

The continent of Africa:

Liberia	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish Africa	1,121	234	1,044	223	2,457	1,899	392	296	34
Total to Africa	1,431	234	1,071	8	188	1,317	214	1,311	243
Not designated	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand total	90,621,079	11,898,995	101,010,852	13,645,692	12,579,968	99,220,467	11,134,926	112,869,575	11,683,713

VIII.—St. *showing the imports of cheese into the United Kingdom during the eleven years ending with 1884.*

a.—Total quantity imported in each year.

Imported from—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Holland	44,664,356	41,454,776	37,008,720	38,302,320	39,776,800	30,601,368	32,501,832	39,057,912	34,862,320	32,788,680	35,377,292
France	95,162,496	107,405,536	101,834,736	1,070,768	1,773,440	136,074,960	131,207,776	139,373,928	2,241,680	2,497,164	3,038,656
United States	24,776,816	31,334,184	28,668,064	23,578,528	29,250,432	31,088,256	31,535,176	23,540,528	108,838,224	110,991,856	109,333,280
Canada	1,716,012	2,163,120	1,723,328	588,844	1,767,536	9,471,232	9,177,100	1,490,168	42,623,424	34,004,496	65,994,544
Elsewhere									1,072,128	1,298,632	2,097,696
Total	186,349,680	182,307,736	171,594,848	185,239,040	220,512,208	200,448,752	198,911,664	206,090,080	198,797,776	201,566,848	215,630,568

b.—Total value of the imports for each year.

	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Holland	\$5,661,364	\$5,241,996	\$4,585,064	\$4,786,614	\$4,950,832	\$3,011,406	\$3,979,516	\$4,039,420	\$4,206,700	\$4,007,556	\$4,342,062
France	12,536,424	13,540,160	12,465,960	13,211,800	16,073,020	11,994,400	16,500,376	17,243,680	13,176,432	13,102,560	12,052,352
United States	3,285,360	3,810,728	3,271,266	2,935,440	2,753,704	2,629,902	3,727,704	4,104,756	5,224,968	6,173,470	7,273,304
Canada	288,784	295,327	273,276	71,832	265,288	348,875	289,314	172,254	102,246	124,082	291,068
Elsewhere											
Total	21,791,885	22,888,209	20,903,526	23,188,867	24,040,894	18,564,723	23,764,920	25,491,200	23,684,366	23,767,314	24,304,644

c.—Price per pound in each year.

	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>
Holland	12.67	12.65	11.38	12.49	12.44	11.72	12.22	12.24	12.09	12.19	12.18
France	13.36	12.60	11.86	16.82	10.66	8.81	14.76	14.18	13.96	14.49	14.44
United States	13.28	12.17	11.68	12.87	10.66	8.81	12.64	12.39	12.38	11.81	11.63
Canada	15.08	13.84	15.86	12.54	15.00	14.12	11.81	12.44	12.38	12.55	11.63
Elsewhere							13.29	15.64	15.15	9.64	9.61
Total	13.10	12.56	12.02	12.52	10.90	9.27	11.96	12.30	12.21	11.79	11.26

IX.—Statement showing the exports from the United States of cattle and cattle products during the year 1884.

a.—Tanned cattle and t.

IX.—Statement showing the exports from the United States of cattle and cattle products during the year 1884.

a.—Horned cattle and beef.

Exported to—	Cattle.		Fresh beef.		Canned beef.	Salted beef.		All other beef.	
	Quantity.	Value.	Quantity.	Value.		Quantity.	Value.	Quantity.	Value.
The continent of Europe :	Number.		Pounds.			Pounds.		Pounds.	
The United Kingdom	168,257	\$17,326,046	115,601,057	\$11,516,369	\$2,542,122	36,831,020	\$2,053,283	578,422	\$60,023
Germany	168,257	30,230			158,286	2,446,900	183,482	578,422	1,564
Belgium					26,688		19,124	13,800	
Denmark					7,387		32,956	1,600	
France					25,182		321,560	2,875	303
Holland							10,069		
Spain					55,977		675,892		
Sweden and Norway					1,890		55,508	16,245	1,739
Total to Europe	168,258	17,356,276	115,601,057	11,516,369	2,817,619	400,840	38,440	611,270	64,645
The continent of America :									
Argentine Republic					13,748				
Brazil					8,077				
Central American States					1,161				
Chile					883				
Danish West Indies					290,354				
French possessions					8,703				
Canada	3,475	96,820	5,029,161	455,003	297	3,990,470	267,665	7,245	234
British West Indies	1,135	96,968			888,085	3,231,018	177,194	7,245	234
British Guiana					699				
British Honduras					863				
Haiti					2,710				
Mexico	8,093	128,630			1,903				
Dutch possessions					1,630				
Porto Rico					8,615				
San Domingo					1,577				
Spanish West Indies					3,790				
United States of Colombia					1,771				
Uruguay									
Venezuela									
Total to America	20,718	469,442	5,029,161	455,003	297,636	9,632,704	765,534	29,814	3,111
The continent of Asia :									
China									
British India									
Total	188,976	17,825,718	120,630,218	11,971,372	3,115,255	50,463,744	43,885	641,084	68,756

IX.—Statement showing the exports from the United States of cattle and cattle products during the year 1884—Continued.
a.—Horned cattle and beef—Continued.

Exported to—	Cattle.		Fresh beef.		Canned beef.	Salted beef.		All other beef.	
	Quantity.	Value.	Quantity.	Value.		Quantity.	Value.	Quantity.	Value.
	Number.		Pounds.			Pounds.		Pounds.	
The continent of Asia—Continued.									
Hong Kong.....					\$11,497	109,700	\$3,494		
Japan.....					3,230	34,200	2,008		
Russia in Asia.....					150	47,600	3,384		
Total to Asia.....					16,250	313,200	24,221		
The continent of Africa:									
French Africa.....					17,409	146,290	10,674		
British Africa.....						56,500	3,701		
Liberia.....					39	600	38		
Spanish Africa.....					64	24,000	1,260		
Total to Africa.....					17,512		15,673		
Not designated.....	290	\$10,247	153,846	\$15,459	24,411	672,254	42,891	53	\$2
Grand total.....	190,518	17,855,495	120,784,064	11,967,331	3,173,707	42,379,911	3,262,275	641,163	67,758

IX.—Statement showing the exports from the United States of cattle and cattle products during the year 1884—Continued.
b.—Butter, cheese, beef tallow, and lard—Continued.

IX.—Statement showing the exports from the United States of cattle and cattle products during the year 1884—Continued.

b.—Butter, cheese, beef tallow, and oleomargarine.

Exported to—	Butter.		Cheese.		Beef tallow.		Oleomargarine.		Grand total, cattle and cattle products.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
The continent of Europe:									
Belgium	Pounds, 9,591,337	\$1,876,341	Pounds, 102,686,547	\$10,508,526	Pounds, 38,627,679	\$2,941,008	Pounds, 1,927,263	\$209,020	\$19,048,403
Denmark	17,626	2,973			3,830,361	270,838	2,865,783	358,973	689,160
France	421,377	60,005	3,888	420	8,514,737	686,551	32,614	4,200	127,430
Germany	64,409	13,794	79,661	2,806	2,044,755	155,075			748,215
Italy	2,846,737	418,329			2,776,511	61,585	127,341	14,471	963,500
Holland	11,840	1,342	113	15	3,251,034	241,468			62,254
Portugal	142	28			173,385	12,734			4,483,836
Russia					70,125	5,357			5,337
Spain									917
Sweden and Norway	709	211							96,100
	376,371	55,680							
Total to Europe.....	13,318,568	2,428,703	102,770,209	10,511,767	57,706,979	4,397,322	38,168,820	4,714,491	56,228,279
The continent of America:									
The Argentine Republic									
Brazil	2,040	400		96	8,872	679			728
Central American States	296,253	56,960		4,300	451,171	37,749			80,466
Chile	59,434	13,046	30,940		5,176	147	885	158	10,962
Colombia	6,354	1,389			1,402	119	6,104	776	36,701
Dutch West Indies	161,744	37,492	42,360	4,333	1,321	119	927	128	159,043
French possessions	625,306	87,492	8,303,396	805,290	3,249,409	216,368	1,062,369	113,324	2,633,418
Guatemala	1,826,496	346,199	621,108	84,316	44,785	3,850	39,761	6,029	2,688,159
British West Indies	1,027,273	208,177	1,154	24,702	102,410	8,600			126,107
British Guiana	16,034	3,425			114,216	21			24,422
British Honduras	13,689	2,825			4,336	21			39,969
Haiti	348,816	63,654	43,591	9,965	443,719	38,276			254,250
Mexico	102,400	23,435	59,267	9,965	12,915	9,686	9,280	1,179	39,969
Dutch possessions	172,165	30,881	7,109	1,042	62,901	4,946			254,250
Peru	13,156	2,591			391,577	81,854			13,473
Spain	182,252	23,654			100,200	7,943	373	55	66,301
Spanish West Indies	441,298	75,477	295,200	45,608	100,200	7,943			284,306
The United States of Colombia	577,453	71,497	210,013	30,791	296,088	22,687			163,873
Venezuela	368,657	70,858	1,302	2,254	115,216	9,807			98,066
Total to America.....	6,924,034	1,234,624	9,905,886	1,193,536	5,371,458	394,222	1,119,678	121,659	4,397,987

IX.—Statement showing the exports from the United States of cattle and cattle products during the year 1884—Continued.

b.—Butter, cheese, beef tallow, and oleomargarine—Continued.

Exported to—	Butter.		Cheese.		Beef tallow.		Oleomargarine.		Grand total, cattle and cattle products.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
The continent of Asia:									
China	Pounds 15,089	\$3,514	Pounds 24,027	\$3,686	Pounds		Pounds		\$17,242
Hong Kong	8,109	1,869	34,159	5,108					26,968
Japan	90,243	19,124	29,322	3,630					28,592
Russia in Asia	4,586	1,138	1,276	233					5,453
British Possessions									5,466
Total to Asia	118,027	35,605	82,084	12,717					78,793
The continent of Africa:									
French Possessions	54,036	9,849	268	38			6,000	\$560	1,324
British Africa	2,194	612	1,311	242					38,550
Libya	100	18							4,565
Spanish Possessions	56,320	10,179	1,519	289			6,000	560	36
Total to Africa	210,455	51,100	109,863	15,483			30,403	5,652	177,284
Not designated	29,627,374	3,750,771	112,869,375	11,663,713	63,091,163	4,793,375	39,322,841	4,842,362	61,396,847
Grand total									

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CATTLE-BREEDING IN EUROPE AND IN THE UNITED STATES.

REPORT BY CONSUL TANNER, OF LIEGE, BELGIUM.

It is my opinion that if a fair test were made of the merits of cattle but little known, including the Belgian breeds, it would be discovered that the "craze" for so-called blooded breeds is a great mistake, and that Americans pay enormous and absurd prices for foreign cattle. These things, it is to be hoped, will be rectified by the reports in answer to the cattle circular.

I believe that if our people at home would use the money spent in the purchase of foreign breeding cattle in constructing quarters for our native cattle equal to the housing quarters of Europe; if they would give the native cattle the same care they give to their high-priced foreign cattle, that within four generations of careful breeding, always selecting the best bulls and the best cows and keeping the others thinned out by the butchers, the United States would have a native breed that would rival any cattle in the world.

If those who pay extravagant prices for foreign cattle will carefully note what it costs to feed and keep such cattle in good condition; the risks and losses in transportation; will keep a careful record of their milk-yield in comparison with the best of our native breeds, giving both the same care and attention, and add up their accounts at the end of the year, bearing in mind the interest on the money invested in the foreign stock, they will find the balance on the side of the native cattle.

In cattle the rule of the "survival of the fittest" should be adopted. An inferior cow should be sent to the butcher as speedily as possible.

If the assertion of the Dutch historian be true that William, Prince of Orange, found that the cattle of England were inferior to those of Holland, it shows that the improvement in British cattle is of recent date.

I might offer a hundred illustrations from my own observations and experience, which would fortify the assertion that our native cattle can be brought to a degree of perfection existing in the cattle of European countries if they will be surrounded by similar conditions.

My brother took much interest in matters of this kind, and made many experiments. The results of twelve years of careful selection of the best native cows and bulls proved that there was only a slight difference between these and the fancy imported cattle, and when the difference in price was taken into account the balance was in favor of the home breeds.

The first Jockey Club that was ever inaugurated was gotten up by the father of Senator Wade Hampton, of South Carolina. What has this Jockey Club not done for the American race and trotting horse? It has not only elevated the standard of this breed of horses by offering sufficient inducement to that end in the United States, but it has done the same in European countries which have followed the example of South Carolina. It has greatly increased the speed in running in

the one, and it has made the trotting horse, which is peculiar to the United States, almost equal to what the running horse was prior to the formation of this Jockey Club. This only applies as an illustration for the subject on hand thus far. The race horse, it is true, comes from a foreign breed, but the trotting horse has been developed therefrom by selection and careful breeding. This shows that where man bends his energies to the development of cattle for any particular quality he is sure to succeed. With similar rules applied in the breeding of even our scrub cattle, I know whereof I speak when I assert that they will develop qualities, as beef and milk yielders, equal to those possessed by the imported stock.

CARE OF CATTLE IN EUROPE AND IN THE UNITED STATES.

As a whole the European people take more interest in their stock than do the people of the United States, and there are more inducements in this regard offered in the former than in the latter. The English hold a dozen agricultural or cattle shows to our one, offering thousands of dollars to our half dollars in premiums, and it is no marvel that the cattle are far superior, that the farmer in England should draw closer to his cattle than does the American farmer to his, treat them kindlier, and give them better dispositions.

Stock-raising, by common consent, seems to have fallen to the lot of the farmer, whereas it should be a special calling; for if it is not an interest of importance enough for the exercise of special talents, it certainly possesses so many phases that some of them suffer from the divided attention which the farmer is compelled to give his other interests. The size and betterment generally of a grain of corn might be much increased if the farmer would make corn a specialty, and thoroughly understood the subject of corn-growing in all its bearings. In having so many interests on his hands one or all of them must suffer.

It is a well-recognized fact in Belgium, and in Europe generally, where interest of the keenest kind is taken in cattle, that there is nothing so injurious to a cow giving milk as to run her, or excite her in any manner, and yet how frequently are reckless boys, with their dogs and whips, sent to drive the cattle home in the United States.

These things, and hundreds of others equally important, never trouble the brains of the American farmer, because his head is full of other matters connected with his calling. How many farmers in the United States can tell how much hay, or other food, is given to each cow during the year and the cost of the same, and the return therefor in milk, butter, and cheese—in fine, does he know if each cow is paying for her outlay, and if so, how much? Perhaps a small number could intelligently answer these questions. It is entirely different in England and on the Continent. There and here a farmer knows his cows as well as if they were a portion of his family. He balances his accounts regularly and knows, at all times, how much he is losing or gaining by each cow. He can tell you the food best adapted to each cow's taste, and which will contribute most to her milk yield.

He knows her exact age, knows when it is best for her to breed, and, above all, the care and attention she demands at his hands, and he gives it to her, knowing, as he does, that by so doing she will return all a hundred-fold to him in the shape of milk. Milk is the first and chief aim and end of a cow's subsistence, and beef the last. If she receives the best nourishing food, is not exercised too violently, and is properly cared for, she will yield a rich supply of milk for a half a dozen years or

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a little more, and then leave a fine carcass for the butcher. She should give 600 gallons of milk per annum, and she will do it if we will do our part towards making her do it. For the 600 gallons of milk that she gives us, care and attention are all she asks from us. This is not only true of one race of cows, but it is true of all, the scrub as well as the finest. This is what the English have long since realized, and this is the history of the fine breeds of cattle in Europe. They are fine because they have been bred up to it by care and kindness.

The American who comes to Europe and pays \$10,000 or \$15,000 for a bull or cow may be truly considered, as he is in England, as having "the American craze for English cattle." The question of breed is a rational one, but why should he want to pay such extravagant prices to England for doing that which he can do himself? The history of all breeds of cattle, sheep, horses, mules, dogs, and cats show this. The breeding of stock not only pays well, but it is a business of absorbing interest. A farmer should have an eye single to these qualities in his cattle, the calf, the milk, and the beef, each of which has a high value of its own, and each can be developed in exact proportion to a man's efforts to develop them. Those who develop the greater number of these requisites to the highest degree of perfection will be those who succeed best with breed, with milk, with beef, and in a pecuniary point of view. Care and attention are the foundation of success, and thereupon is laid the superstructure of the requisites mentioned, a superstructure which is perennially repeating itself, improving or deteriorating as the foundation is kept in repair, is strengthened and improved.

Few farmers in America are there who have a genius or even taste for selection and classification of animals, but at the same time by drawing nearer their cattle, and observing them closely, and studying their wants, it would be strange indeed if a marked change for the better were not soon perceived in our own home breeds without dashing them with foreign stock. With the care and attention given to cattle in England and on the Continent, compared with the slipshod manner of treating them in the United States, it is in no way strange that there should be the difference that is so palpable. With the personal attention, feed, &c., in Belgium a cow will cost her owner at least \$108 per year. If she gives six hundred gallons of milk in that time she pays for her maintenance and attention many times, and most of the cows here do it. If you were to tell an American farmer that he must spend \$108 per year on his cow he would want to consign you to a lunatic asylum at once.

THE COST OF PRODUCING FINE CATTLE IN ENGLAND.

The following will give an idea of what it costs in England to have fine cattle. I quote from the *Farmers' (London) Journal*:

The cows are kept under cover for about six months, and are tied up in pairs, 40 in one house and about ten in another. The urine runs into a large underground tank, from which, when full, it is carried on to the pasture by a water-cart. The food of the cows varies with their condition, and the more milk they are giving the higher they are fed; but when dry, or nearly so, they have only roots and hay or straw, unless it is decided not to keep them for the purposes of the dairy, in which case they are milked and fattened at the same time. When fat they sell for about \$150. The following is the amount of food, in tons, consumed by the cows while in the stalls:

Cotton cake	13
Barley meal	11½
Bran	10½
Chaff (½ hay, ½ straw)	70
Mangels, pulped	224

In addition to this, 13 tons of cotton cake are used during the summer. It is somewhat difficult to estimate the number of acres of pasture used by this herd, as the cows have the first run of the grass, and the coarser and rougher part of the pasture is fed by other stock. Possibly each cow may consume the produce of $1\frac{1}{2}$ acres.

In the winter months the milk sells for about 22 cents per gallon, a price which is hardly more than sufficient to cover the cost of the food and attendance, so that the dairy does not often get back more than the manure free of cost. The annual expense of labor upon each cow amounts to about £2 15s.

The following are the prices of some of the foods enumerated above:

QUOTATIONS.		£	s.	d.
Phoenix pure linseed cake, per ton	.....	9	10	0
Phoenix pure undecorticated cotton-cake (future delivery), per ton	.....	6	5	0
Yellow rape cake, per ton	.....	6	10	0
Phoenix pure linseed meal (in bags), per ton	.....	10	5	0
Phoenix pure cotton-seed meal, per ton	.....	7	0	0
Yellow rape meal or nuts, per ton	.....	7	5	0
Phoenix pure palm-nut meal, per ton	.....	7	0	0
Decorticated cotton-cake, per ton	.....	6	17	6
Decorticated cotton meal, per ton	.....	7	10	0
Clean sieved linseed, suitable for feeding purposes, per 416 pounds in bags.	.....	0	52	0

		Per ton.		
		£	s.	d.
Linseed cake:		8	10	0
Best quality, English	.....	8	10	0
American thin	.....	8	10	0
Other qualities English	.....	8	5	0
American	.....	7	15	0
Marseilles	.....	7	12	6
Rape cake, East India seed	.....	5	15	0
other descriptions	.....	0	0	0
Cotton cake, best London undecorticated	.....	5	12	6
Cotton cake, decorticated	.....	0	0	0
Corn and mixed cake, English make	.....	7	10	0
Palm-nut meal	.....	5	10	0
Locust beans	.....	5	5	0
Rice schudes, whole	.....	2	10	0
ground	.....	3	10	0

A little addition here on the part of the American farmer will open his eyes to many very startling things. It will show him that a cow in England gives a large and rich quantity of milk, but it shows also that she would not be a paying institution for the American. The example given above will have to be taken as an illustration, though in my opinion many breeders of fine cattle feed much higher than those above mentioned. The following, taken from the same journal, will bear me out in this:

Mr. R. E. Turnbull, of Twyer's Wood Farm, Hedon, Hull, who has gained the royal prize for having the best-managed dairy farm in Yorkshire, although having good pastures, which produce a high quality herbage, invariably supplements it with artificial food. Now, as the generality of dairy farmers on even comparatively poor pastures do nothing of the kind, the fact appears worth knowing that Mr. Turnbull considers himself amply repaid for his enterprise, although carried out to an extent of surprising liberality. From May 1 to October 21 the allowance of cake, half linseed and half decorticated cotton, is from $2\frac{1}{2}$ to 7 pounds per animal per day, according to size and age, while in July they have green tares and in August and September cab-bages in addition. Of course during winter the allowance to cows and heifers yielding milk is still greater, comprising for cows 3 pounds of linseed cake and some $3\frac{1}{2}$ to 7 pounds each of crushed oats per day; and heifers 5 pounds each either of oil-cake—one-half linseed, the other half cotton—or equal proportions of linseed cake and crushed oats. The other winter food consists of pulped roots and hay partly chafed, or when oat straw is good it is used as a substitute for hay, 10 pounds of oat straw being considered an equivalent for 7 pounds of hay. Mr. Turnbull makes a good price for his milk partly by retail sale in Hull and partly by conversion to high-class butter, which sells for 1s. 7d. per pound, and he calculates that he realizes 19d. per gallon for

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ted above :

	£	s.	d.
...	9	10	0
...	6	5	0
...	6	10	0
...	10	5	0
...	7	0	0
...	7	5	0
...	7	0	0
...	6	17	6
...	7	10	0
ags.	0	52	0

Per ton.	£	s.	d.
d.	8	15	0
0 to 8	10	0	0
0	8	10	0
0	8	10	0
0	8	0	0
6	7	15	0
0	6	0	0
0	0	0	0
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all his milk to whichever purpose applied. His summer average in quantity is 10½ quarts per cow and in winter 8 quarts per cow per day.

Probably the publication of facts in relation to the management on this farm will lead to the conviction being entertained that dairy farmers in general do not feed high enough. This is especially true of those who convert their milk to butter. Their profits thoroughly depend on the *high quality, not quantity, of the milk*—the large proportion and thickness of the cream. Consequently the addition of some oil-cake or maize meal to the ordinary food would be almost sure to pay, yet it is undeniable that on wretchedly poor pastures milch cows are seldom, in ordinary farming, allowed cotton cake, maize meal, or anything else supplementary, although the milk they yield is appropriated to butter-making. A farmer of the advanced school said a little time since, "I cannot afford to let my cows which yield milk feed on grass alone," uttering these words because he saw that parsimony in their feeding would be the greatest possible extravagance. A similar rule applies almost throughout the entire domain of farm husbandry, for not only the most liberal feeding, but bountiful manuring and highest management, will be found in most cases to be attended with the greatest economy.

This feeding I have no doubt will astonish the American farmer, but it has made the English cattle "blooded cattle." The following, relating to the same subject, will further demonstrate the importance of this subject. It admits the Americans who are in search of English cattle behind the scenes, as it were.

A CAUTION TO GALLOWAY BREEDERS.

Galloway breeders have special reasons at the present time why they should be careful to leave uncastrated only such beasts as will do credit to the breed. While some American stockmen have begun to purchase Galloways on the well-founded idea that they are especially adapted to their severe and variable climate, yet the reputation of the breed as a beef-producing race of cattle has yet to be fairly and widely established on the other side of the Atlantic. In many instances owners of ranches are only making inquiries regarding them, and if inferior specimens, especially bulls, are exported, the ultimate success of the breed will be seriously injured thereby. They will be judged by the samples that are sent out, and if these compare unfavorably with the Shorthorns, Herefords, Polled Angus, and other varieties with which they are already acquainted to some extent, the reputation of the Galloways will suffer in a proportionate degree. Let owners of herds retain as bulls only those calves whose personal merit is good. Apart from the question of personal merit, if too many are kept the market will be overstocked and prices will be affected thereby. When once the reputation of the breed has been firmly established in the Western States, it will be impossible to produce too many, provided they are personally of sufficient merit, for the plains to be stocked are practically illimitable. But in the mean time this state of matters has not yet been reached.

Moreover, breeders of pedigree Galloways must make up their minds to feed their young cattle much more liberally than most of them have been in the habit of doing. And this remark applies to heifers as much as, if not even more so than, to bulls. In regard to the latter, it has long been known that if calves were not extra well kept they would not be fit for service when yearlings, and hence, not being marketable at that age, a whole year's keep of them was lost. This fact insured bull calves being fed liberally in almost every instance. But, with comparatively few exceptions, heifers have been very sparingly fed. It has not been customary to have Galloway heifers dropping their calves until they are three years of age, and this has afforded ample time to bring them to maturity by slow degrees. But the circumstances are now entirely different. Breeders of pedigree Galloways must look to the American market for purchasers. It is not probable that American stockmen will put Galloway heifers to breeding purposes at an earlier age than is done in this country, but it must be borne in mind that when our Blackskins are taken to the other side of the Atlantic they are put alongside of animals of other beef-producing breeds of the same age, and if they are not as well grown and as forward generally as these, their reputation cannot but suffer in a corresponding degree.

The breeds with which they are brought into comparison in this way are the short-horn, the Hereford, and the Polled Angus. Every one of these has been liberally fed, and even pampered, and therefore it is a severe ordeal to which the Galloways have to be subjected in this respect. If, therefore, the breeders of the south country Blackskins are to do justice to their favorites, and, indeed, if they are to be true to their own interests, they must adopt a much more liberal system of feeding, and that, too, from the very first, than has hitherto been customary among the rank and

file of them. We do not, indeed, advocate any measure of pampering, which might make the beasts more tender, and lessen that hardness which has been one of their most valuable characteristics from time immemorial. But there is a moderate degree of steady good keeping which is quite compatible with the safe preservation of all the distinctive and valuable characteristics of the breed, and it is this systematic liberal feeding, even from calfhood, which we advocate. Quality, of course, is important and desirable, but the American purchasers put great stress upon size, and this cannot be attained without a steady liberal diet.—*Dumfries (Scotland) Courier.*

As I consider this subject one of first importance to the American stock-raiser, I feel that it cannot be pursued too far.

FEEDING-STUFFS.

This was the subject of a very instructive lecture delivered in the Guild Hall, on Friday week, by Dr. Macadam, Edinburgh, under the auspices of the Strathern Central Agricultural Society.

Dr. Macadam remarked that the food of the animal had three functions to fulfill. First, to supply combustible matter or fuel to be burned within the living organism, and thus keep up the animal warmth; secondly, to replenish the wear and tear of flesh atoms; and, thirdly, to contribute extra fatty matter and flesh atoms to be stored up in the animal structure so as to increase the build and weight of the animal. Besides these, there are the elements of bone matter and other saline substances. The main natural feeding-stuff must always be ordinary pasture, and the experience of every agriculturist points to a decided difference in the nourishing properties of the pasture of one field or district as compared with that of another. This difference is due to the varying proportion of water present. In natural grass the water present ranges from 70 to 90 per cent. The best grass in ordinary dry seams or dry soil contains about 70 per cent., whilst, in rainy seams or damp soils the water is increased to 80 per cent.; and in the produce of irrigated field pastures the water runs as high as 90 per cent. of the weight of the succulent grass. Consequently, it follows that of every 10 pounds of grass from 7 to 9 pounds consist of water, and in the average only one-fifth of the total weight consists of dry feeding material. When the grass is air-dried and becomes hay, the proportion of moisture is reduced to about 16 per cent., so that only one-sixth of hay consists of water, and 1 ton of hay contains the solid, dry, nourishing elements of fully 4 tons of ordinary pasture grass. Turnips contain even a larger average proportion of water, for 90 per cent. of ordinary turnips consist of water; so that in every 10 pounds of turnip there is only 1 pound of dry feeding-stuff. Potatoes contain 75 per cent. of water, being equal to three-fourths of their entire weight. The cereals contain much less water, the average proportion in wheat, oats, &c., being 15 per cent., or less than one-sixth of their whole weight; so that five-sixths consist of dry feeding material. In linseed-cake and other cakes the moisture averages 12 per cent., so that one-eighth of the weight only consists of water, and seven-eighths of dry feeding-stuff. Considering, therefore, the question of food and thereby in the light of the relative amount of dry solid matter in a given weight of the respective articles consumed by the animal, it follows that to obtain sufficient dry solid food the animal may partake of 1 pound 2 ounces of feeding-cake; 1 pound 3 ounces of cereals or air-dried hay; 4 pounds of potatoes; 5 pounds of ordinary dry pasture; 10 pounds of succulent grass from irrigated fields, and 10 pounds of turnips. When the respective qualities of dry feeding materials are considered, the nourishing properties of the natural and artificial feeding-stuffs vary even in a greater ratio than the percentage of moisture. Thus the proportion of flesh-forming or albuminous matters present in ordinary grass and clover averaged $2\frac{1}{2}$ to 3 per cent.; in hay, 10 to 12 per cent.; in oats, 16 per cent.; in beans, 20 per cent.; in potatoes, $2\frac{1}{2}$ per cent.; in turnips, three-fourths per cent.; and in linseed and rape cakes, 25 per cent. It follows, therefore, that in 1 ton of cake there was as much flesh-forming matter as in 14 tons of oats, or $2\frac{1}{2}$ tons of hay, or 8 tons of ordinary pasture, or 11 tons of potatoes, or 33 tons of turnips; and an ox or sheep would require to consume these respective quantities of the feeding-stuffs in order to obtain a similar amount of flesh-forming or albuminous matter. At the same time, however, it might be remembered that the amylaceous or starch group of compounds, played also an important part in the sustenance of the animal. It was very questionable how far the richer and flesh-forming foods, such as feeding-cakes, could be employed with safety in the rearing and fattening of stock without large admixture with the less nutritious kinds of food. An excessive quantity of cake not only led to injurious results in the health of cattle and stock, but determined much waste of nutritious matter, which passed through the animal system with the sole result of enriching the manure.

I have considered this subject of sufficient importance to make inquiries concerning it in England. A friend in that country sends me the following newspaper extract, which I hope may prove of some value at home:

EXPERIMENTS IN FATTENING STEERS.

Professor Brown, experimental superintendent of the Ontario Agricultural College, writes in his official report on the above subject:

In speaking of the weight of a fattened steer, and the daily increase it makes, we have to consider breed, weight of calf when dropped, food, management, and age. The nearer birth the greater the daily rate until the calf weight is lost among the tens-of-hundreds. Thus, a calf weighing 750 pounds is due about 10 per cent. to its birth weight; the yearling that weighs 1,000, $7\frac{1}{2}$ per cent.; the two-year-old scaling 1,500, 5 per cent.; and the finished, or rather the over-fed, show beast of 2,000 pounds can only record about three and three-fourths of its weight as obtained from the average birth-weight of 75 pounds. Until the animal, therefore, is over 1,000 pounds, we should always remember the effect of this birth-weight; thereafter it may be left out of calculation.

The example I wish to submit to our breeders and feeders now, is that of a pure white, thoroughbred shorthorn steer, calved 6th May, 1881, bred by Mr. Hudson, of Myrtle, and bought by us from Mr. Hope, of Bow Park. On the 9th of April, when 703 days old, it weighed 1,710 pounds, which, of course, gives a daily rate of 2.43 pounds; the calf-weight from this would reduce the actual daily increase to 2.33 pounds; something, no doubt, but not enough to interfere when understood in practice. A yearling steer over 1,700 pounds is unquestionably a fine example of what breed, food, and management can do, and if we do not spoil him he should scale 2,000 pounds when two years and four months old, at the Provincial Exhibition at Guelph, on 25th September.

Some interesting experiments were also made for beef and milk with Hereford and Aberdeen poll grade steer calves. On this phase of the Canadian experiments Professor Brown says:

Having now got over the initiatory work of establishing herds, and acclimatizing breeds, we are diverting considerable attention to the making of grades for milk and beef respectively. Our progress in milk experiments is in advance of the other, as evidenced in previous reports, as also is this advance issue. We make no excuse for this. Our past beefing experiments have been with high-graded shorthorns, and the facts, to date, are sufficient to base upon in any comparison with other grades, as we will have to do when time calls; and what I wish to do is to place on record what our farm has on hand for such a purpose. The same cows, well-graded shorthorns, averaging six years, that have been used to produce the steers, with a thorough-bred shorthorn bull, were selected to mate with the Hereford and Aberdeen poll bulls. Necessarily, one of the difficulties is to arrange about equal birth-dates, and another is to get bull-calves. We have been more fortunate with the latter than the former, as shown by the following list:

Hereford grade steers: 9th April, 1882, Huntingdon, No. 184 (ear label); 6th October, 1882, Heathfield, No. 193 (ear label); 28th October, 1882, Hartford, No. 191 (ear label).

Aberdeen poll grade steers: 24th June, 1882, Aberdeen, No. 183; 27th June, 1882, Aboyne, 179; 2d August, 1882, Abernethy, No. 182.

The average Hereford steer is, therefore, thirty-four days younger than the Aberdeen poll average, and this must be most carefully noted in all future reporting.

On 9th April, 1883, the earliest birth of the lot, when a Hereford was one year old, weights, ages in days, and daily rates were as follows:

Description.	Weight, 9th April, 1883.	Age in days.	Daily rate of increase.
	Pounds.		Pounds.
Hereford:			
Huntingdon.....	790	365	2.16
Heathfield.....	552	185	3.00
Hartford.....	492	103	3.02
Aberdeen poll:			
Aberdeen.....	740	289	2.58
Aboyne.....	750	286	2.60
Abernethy.....	670	243	2.75

A mean of 2.73 for the Hereford and 2.64 for the Aberdeen poll.

FEEDING CATTLE ON TURNIPS.

The following are the results of an interesting experiment made by Mr. Robert Logan, Birkenside, Earliston, with the view of testing the comparative merits of sliced and pulped turnips as a feed for cattle: On the 11th of October, 1882, three Canadian bullocks, live weight 32 cwt., 3 quarters, were bought for £61 5 s., or 39s. 2½d. per cwt., live weight. On February 6, 1883, the same animals were sold at Haymarket, Edinburgh, live weight 43 cwt., 14 pounds, for £105, or 48s. 8d. per cwt., live weight. The gain in weight was 10 cwt., 1 quarter, 14 pounds; in money, £40 15s. These bullocks were fed on sliced turnips, of which they consumed 218 pounds per 24 hours. On October 11, 1882, a second lot of three Canadian bullocks, live weight, 31 cwt., 2 quarters, were bought for £61 15s., or 39s. 2½d. per cwt., live weight. On February 6, 1883, these were sold at Haymarket, live weight, 39 cwt., 2 quarters, 11 pounds, for £101, or 51s., per cwt., live weight, the gain in weight having been 8 cwt., 11 pounds; in money, £35 5s. These bullocks were fed on pulped turnips, of which they consumed 162 pounds per twenty-four hours. Lot 1 when slaughtered yielded 60 per cent. on gross live weight; lot 2 when slaughtered yielded 61 per cent. on gross live weight. Both lots were valued at the same price per cwt., according to their live weight on October 11. When sold according to live weight those fed on pulp made 2s. 4d. per cwt. more, and yielded one per cent. more beef. In addition to the weight of turnips given, as above stated, each lot were fed with the same proportion of hay; those fed on sliced turnips feeding it, in the ordinary way, from hecks; those fed on pulped turnips having it cut amongst the turnips. In addition each animal had 9 pounds of mixed cakes and bruised barley. The whole were fed in single boxes. Lot No. 1 made 10s. per head more than No. 2. The former, however, consumed 56 pounds more turnips per day than No. 2. The expense of pulping is slightly higher than slice feeding, but the value, per live weight and yield of beef, according to the same, favors pulp.

FOOD OF PREGNANT ANIMALS.

The food of pregnant animals is an important consideration. Creatures in this condition should be well fed, and especially if they have to accomplish a certain amount of labor or yield milk. The appetite is generally increased, and there is a tendency to fatten. This tendency should be somewhat guarded against, as it may prove troublesome, particularly if allowed to proceed to an extreme degree, when it may retard the development of the fetus, induce abortion, cause difficult parturition, or give rise to serious after consequences. This precaution is more to be observed in the second than the first half of pregnancy, when the food should be plentiful, but not in excess, and flesh more abundant in the animal than fat. The food should also be of good quality, very nutritive, easy of digestion, and not likely to induce constipation. Indigestion should be carefully guarded against, and unaccustomed, hard, damp, bulky, fermentable, moldy, or otherwise hurtfully altered food, should be avoided, as it is likely to prove indigestible, occasion tympanitis, and produce other injurious results.—*Fleming's Veterinary Obstetrics.*

FEEDING OF DAIRY COWS.

The honorable secretary of the Munster Dairy School, Cork, writing to a contemporary, says: There are sixteen cows in milk, calved three and four months. They were getting each daily from 5 to 7 pounds, according to yield, of following mixture: Decorticated cake, bran, and Indian corn meal, with four stone of mangels and hay. The return not proving satisfactory, I proposed the dietary should be as follows: 2 pounds bean meal, 2 pounds crushed oats, 3 pounds decorticated cake, 3½ stone mangels. This feeding was commenced on March 10. On March 23 the cows had to get fan-saved hay (musty). Note the result:

Date.	Total yield per week.	Set for cream.	Butter.	Date.	Total yield per week.	Set for cream.	Butter.
	<i>Quarts.</i>	<i>Quarts.</i>	<i>Pounds.</i>		<i>Quarts.</i>	<i>Quarts.</i>	<i>Pounds.</i>
March 3	1,065	948	67	March 24	1,078	1,056	73
March 10	1,043	977	66½	March 31	1,107	1,036	69
March 17	1,135	976	72				

Percentage of fat by lactobutyrometer: March 9, 2.56; March 29, 2.7.

These returns were carefully and accurately kept by Mr. Smith, the superintendent.

FATTENING AMERICAN CATTLE IN ENGLAND.

We see from these extracts what importance is attached to the subject of feeding in the country that is supposed to possess the best breeds of cattle in the world, and how thoroughly this subject is understood there. I submit these extracts because example is worth more than precept in matters of this kind. When I speak of England, however, in this connection, the same remarks apply equally to Europe entire. Perhaps nothing would go further to convince the American of his folly in the parsimony of his feeding, and the want of attention he gives his cattle, than to tell him that it frequently happens that the cattle he ships to England and to the Continent are taken in hand by European stock raisers after arrival and the European system of care and food applied to them and double profits are realized on them, when the American might have pocketed this by the same attention on his part, and at less expense, as his food is cheaper. If I had the space I might offer a hundred illustrations of this that have come within my own observation. This, however is the most satisfactory one:

AN AMERICAN OX.

In the first importation of live stock from America into Cardiff was a white Short-horn ox, in the month of July. He was transferred by his purchaser to the pastures of Graunge Farm, Mumbles, near Swansea, at £45. Here with an English cow for his companion he made good progress, won a prize in 1872, and at Christmas weighed 80 score 18 pounds, realizing for his feed of £67 8s. 4d.—*The London Standard*.

Persuasion, scolding, and argument are unnecessary to show our people their folly in their neglect of cattle when we have such examples as this. At a recent exhibition in Paris a Canadian cow was universally admired, and when I inquired to what breed she belonged, the Frenchman only shrugged his shoulders and said she came from America as common cattle, and that he had polished her up. "What did you do for her?" I inquired. "Well," says he, "I curried and brushed her every morning because she was dirty and rough; I fed her on the best cotton-seed cake, bran and hay, and kept her in the stall all the time. She has borne one calf since I have had her. As a milker she is not a success, but the calf will be on exhibition at the fair two years hence, and I am sure will take a premium; it is the first calf in France." The food enumerated here (indeed, all food) is two to one cheaper in the United States than it is in Europe. This must be, since we supply Europe with the articles that they value most as cattle food. With such facts placed before our people, it seems to me they can see wherein they fail, and that they have untold treasures in their home breeds of cattle if they will go to work properly to develop them. To what purpose is it that they should come to Europe and pay exorbitant prices for cattle if they allow them to deteriorate, as the above report shows they do?

EXERCISE FOR COWS.

Mr. L. B. Arnold says that the amount of exercise which an adult cow requires is but very little, and all she gets beyond what is necessary for her health occasions a draft upon her system which must be made up by extra feed or a loss in her milk product, or perhaps both effects may be apparent. Every expenditure of force, whether in locomotion or labor, is made at the expense of the food consumed by the animal exerting the force. There is no evasion of this rule, and he who causes his animals, whether milk cows or beasts of burden, to make exertions that could be avoided is wasting his means of profit. The man who, having a given load to move twenty miles, takes a path that will require twenty-five miles to reach his destination, is not more unwise than the dairyman who causes his cows to do 25 per cent. more traveling and

exertion than is necessary to supply themselves with food. This may seem like spinning a fine thread, but it is the sum of such threads that determine the question of profit with the dairyman. The loss in milk production by more travel in grazing than is necessary for maintaining the health and vigor of a herd of cows is often very considerable. Very few herds are free from some loss in this direction. In woodland pastures, and rough and hilly ones, and in ranges necessarily large because the land is poor and feed scanty, the yield of milk is always inferior, being cut short by the long distances necessary to travel for gathering a supply of food. The loss in milk from feeding in pastures of such a character as to require cows to be all day in filling themselves may be plainly seen by any observant farmer. A difference of 25 or 30 per cent., and even of 50 per cent., will be easily made between such fare and a full supply of feed easy of access, either by grazing or by soiling.

Large ranges of pastures are not advisable for cows in milk. It is better to supply only pasture enough to furnish grazing till grass begins to fail from dry weather, and to supply the herd with soiling crops through the middle of the summer at least. The saving in land where land has much value is enough by this course to pay for all the extra labor it occasions, and the increase of milk which will be gained becomes a source of increased profit. One would hardly imagine, until he tries it, how much the yield of milk for the season will be augmented by such a course. In the first place, it saves the cows an immense deal of travel if they can have their feed presented to them in the stable or other convenient place, instead of their having to run after it. Then, it often saves them a great deal of depressing exposure to sun and storms and flies. They are enabled also to make better use of the food they consume, by reason of having more leisure for ruminating than they can have if they have to pick their living by constant travel. The sum of all these advantages has a telling effect upon the resources of the farmer, and he cannot afford to ignore them. If he has rough places, woodland, or thin pastures, which will afford only scanty feed, it is better to put young stock upon it to pick the scanty feed. They can use it without loss. They require considerable exercise to work off their surplus energies, and to promote growth of frame and assimilation, and they won't mind the travel necessary to gather the grass from such places. But the milk cow which has her energies taxed to the utmost to elaborate a bountiful flow of milk has no vital force to spare. She needs to husband to the best advantage all she has to enable her to do her full work, and the farmer who intelligently plans his operations will spare her all the exertions he possibly can.

CATTLE SHOWS IN ENGLAND.

If I enter on such particulars it is because I sympathize keenly with the Department in its efforts in behalf of American cattle, and because it seems to me that nothing would be more valuable to our breeders than the experience of countries that surpass us and have brought their cattle to such a high standard of perfection. There are other considerations that must not be ignored that have contributed to the advancement of the standard of European cattle, and to leave this consideration unmentioned would be to make my dispatch imperfect, viz, cattle shows or exhibitions. Apart from the interest and benefit that accrue to England from having fine cattle, the system observed in that country, and to a less extent on the Continent, of having what is called shows, offers additional stimulus and incentive to have fine cattle, that has caused the cattle of Europe to be *pushed*, as it were, to the high point which they have attained, and keeps them there. It has caused common stock to disappear entirely from Europe.

In England for every distinctive breed of cattle there is a society to look to the interest and its advancement. This is done by shows and exhibitions. There is a Shorthorn society, a Jersey society, a Devon, a Southdown, and a Cart-horse society. Where such keen rivalry is excited as is done by these numerous societies, all having for their special aim the advancement of the different breeds, it is in no way curious that scrubby cattle of every kind have disappeared and that they have been converted into blooded cattle. This is a truth that it seems to me shows Americans that they have but to offer the same inducements to accomplish like results.

HOW CATTLE DEGENERATE.

Should the careful nursing, constant and minute attention, bestowed upon the English breeds of cattle be relaxed; should they become careless and indifferent, herd them together in vast numbers, and place care-takers over them that are reckless and vicious, within twenty years almost every trace of what is known as fine blooded cattle would be eradicated. As proof of this no better illustration could be offered than we find in the wild mongrel Texas herd. These cattle are unquestionably descendants of the Spanish stock introduced into Mexico by the early Spanish settlers towards the year 1500. We know from history that Mexico possessed no cattle or horses, because those ridden by Cortez and his band inspired superstitious reverence that was one of the chief factors in the easy conquest of Mexico. We know from history that both cattle and horses were imported by the Spaniards into Mexico. With a mild climate, forage in abundance, the absence of beasts of prey, and the negligence of man these cattle increased to a marvelous extent, but relapsed into their natural state and lost every trace of breeding that their ancestors had so highly possessed. It would not have been worth while for the Spaniards to import cattle to Mexico if they had been as inferior in quality as those of Texas; therefore we know with almost exactness that the cattle from which this mongrel race has sprung was the splendid stock of Spain, that now holds equal rank with the best breeds in Europe.

What lesson does this teach Americans? It shows them on the one hand what care and attention will do and on the other what negligence will undo. It shows them that the question of blood is a question of care and attention, and that we have untold treasures in the races of cattle that we now regard as scrubs.

IMPORTS OF BLOODED CATTLE INTO THE UNITED STATES.

Mr. Wade Hampton, sr., of South Carolina, was one of the first to import blooded cattle into the United States. These were cows and bulls of the Durham race. I think this was about the year 1782 or 1783. By careful attention this stock flourished and did exceedingly well. The common cattle of the neighborhood of Columbia, S. C., were dashed considerably by what was soon known as the "Hampton stock." I do not know the exact subsequent history of this stock, or whether there exists a trace of it now. It would be interesting and valuable to the Department to get a statement from Senator Hampton relating to this subject, as well as to others in the United States who are interested in the subject of breed. From such data one could form an opinion perhaps of how short a time is required for a breed of cattle to lose their distinctive qualities, and from that to judge of how long it requires for a breed to become pure. That which I have said here of cattle may be equally applied to our horses.

THE AMERICAN FARMERS AT FAULT.

With a virgin soil, a large area under cultivation, good seasons, and an abundant yield, life has gone so easy with the American farmer, that economic questions have not, up to this time, forced him to a study of these things, as it has in Europe, where density of population is so evenly balanced with the means of subsistence. There is a sad want of enterprise on his part; his progress has not kept equal pace with that

of the mechanic, the artisan, and others in their productive achievements, when less mental and laborious efforts are required from him than any other calling to arrive at equally successful results. I am glad to see the Department taking time by the forelock, and doing for the farmer in its efforts to elevate the standard of our cattle, that which density of population will force succeeding generations to do.

Nearly all of our States have agricultural departments connected with their State governments. If each State would hold a series of fairs or exhibitions of all agricultural products, with liberal inducement in the shape of premiums for the best native breeds, requiring the exhibitor to give a full account of the father and mother of the cattle they exhibit, the mean temperature of the country from which the cattle came, the nature of the subsoil, food, and other things that would require a higher and more thorough knowledge on the part of the farmer concerning his cattle, it would go far to elevate the standard of home breeds. This is not speculative, it is a certainty, since the same system works so well in Europe.

I would recommend also to each of our State agricultural departments to purchase, say one hundred of the best of our common mongrel cattle, breed and care for them by the most approved methods, and try to solve the problem of how long it requires, with care, to make a breed of cattle pure. My reason for mentioning so great a number to experiment with is this: Out of one hundred cattle experiments could be made to develop certain qualities, such as those that would give the highest quantity of milk, like the Holsteins or Shorthorn; and others that would give the best quality of milk, like the Jersey; those that would give milk for a certain quality of cheese, like the Fletchet, &c. The results of these tests might be shown at a national or a permanent international exhibition, to be held in some central point, where all those who take an interest could see the result and benefit by it. From this number of cattle worthless cattle could be thinned out and the best retained to breed from.

I inclose list of "Agricultural shows" held in England the present year. This does not include the different society shows, such as the Shorthorn Society, the Jersey, the Carthorse, and hundreds of other societies. We have two cattle to one in England, our population is nearly double that of England, and in intelligence and polish the American farmer is superior to the European, but in practical results he lags far behind.

THE AMERICAN CRAZE FOR ENGLISH CATTLE.

The English farmer finds another inducement in having fine cattle over those of our own country, and this is in "the American craze for English cattle," as this extract from the Times will show:

The American demand has given Hereford cattle a heightened position and better prices, but the impetus has been nothing equal to that accorded to the Aberdeen Black Polls. The extraordinary advanced prices realized for the more fashionable strains of these last season are well known, and may appear likely enough to be fully sustained for some time to come. The dispersion of the Bridgend Polled herd on the 13th of September affords sufficient evidence of this, when some of the Pride strains were disposed of at marvelous figures. The Prides sold pretty much the same position among the Black Polls as Duchesses do to Shorthorns, and at the Tillyfour sale in 1880 Mr. R. C. Auld, the owner of the Bridgend herd, was tempted to give 270 guineas for a female of the tribe. At that time his investment was looked upon as almost as great a piece of folly as Mr. Platt's purchase of the Hereford bull Horace in 1876 at 200 guineas, or Lord E. B. de la Roche's splendid bid of 1,000 guineas for Duke of Cam-

* List published immediately following this report.

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naught in 1875; and as to Mr. Auld's Pride of Aberdeen 9th, the animal having enriched the herd with three daughters since coming into his possession, all four were brought to the auction ring on the 13th of last month, and realized the magnificent sum of 1,365 guineas. Pride of Aberdeen 9th was bred by the late Mr. McCombie, and formed one of his famous Parisian group at the Grand International Exhibition. She was purchased by Mr. Wilken for 385 guineas, but her yearling daughter realized 510 guineas, the highest price, it is said, yet given for a Polled animal. The purchaser of the latter was Mr. Walker, who was understood to have bought her for America.

While the demand for Herefords appears to be all-in-all for bulls, but nothing very extraordinary for cows and heifers, that for Aberdeen Black Points gives a similar prominence to females, as is to be found in sales of Shorthorns. Thus at the Bridgend auction now being referred to, 12 cows averaged £114 19s. 6d. each; 11 two-year-old heifers, £85 10s. 6d.; 8 yearling heifers, £156 3s. 9d., and 7 heifer calves, £90 7s. each, but the average for 2 two-year-old bulls was only £53 11s., and that for 11 bull-calves, £29 4s. 2d., causing the general average for 51 animals, the total number sold, to be £90 16s., the sum realized being £1,631 11s. The North British Agriculturist gives the averages and highest individual prices of the principal tribes sold at this sale, which are as follows:

Tribes.	Average.	Highest price.
3 Vines	£99 8 0	£204 15
5 Prides	310 16 0	535 10
3 Jennets	116 4 0	199 10
19 descendants of the Queen foundation	72 14 7	183 15

This is how Americans make high feeding and good attention pay in England. With such prices an Englishman can well afford to feed and otherwise spend nearly \$200 per annum on a cow or bull. In Europe apple and pear exhibitions are held, as well as egg and chicken exhibitions; in fine, there is as great a variety of exhibitions as there are articles to be devoured by man, all having for their *bent* the elevation of the standard of the article exhibited. Will it not occur on the same line of reasoning that Americans will one day go to England for their cats, dogs, fish, pears, apples, as for their cattle? Dogs have already been imported into America at extravagantly high prices paid in England. There is no telling where "a craze" will stop, once it begins. We have also committed the same folly in importing "blooded hogs." Think of "a blooded hog," so called because it was large, in fine order, and had the marks of care and attention, and easily palmed off on the American as "a blooded Berkshire."

If Congress would enact now that there would be opened in the year 1900 a grand international exhibition, and that a premium of \$100,000 would be given for the finest exhibit of *native breeds* of all kinds, and the same for all breeds of cattle from every quarter of the world, I believe firmly that some enterprising American could take each premium; that is to say, he could take the premium not only offered for the American breed, but that the American cattle that had won the premium could compete with all foreign cattle and gain the second also. At any rate this is worth a trial, and \$1,000,000 offered in premiums alone could not be better spent, as it would stimulate the American stock-breeder to the necessary effort to elevate the standard of native breeds.

GOVERNMENT ENCOURAGEMENT TO EUROPEAN STOCK.

All the exhibitions held in Europe are encouraged in every way by the King, Queen, Emperor, or what not, of the country in which the exhibition is held. The Queen of England exhibits cattle at every show in England, as does the Prince of Wales. A cow, the property of the

Queen, took second premium at a recent exhibition, and a bull third. No exhibition is too insignificant and unimportant in Belgium for the King and Queen of the Belgians to open in person and inspect personally each article and to encourage it by being an exhibitor of the product. This, it seems to me, is setting an excellent example to our governors and others at home who hold as high positions in public esteem and are looked to as much for examples. But, alas, politics is the all-engrossing topic with most of our governors and legislators, and anything that is outside of this is insipid to them; and, therefore, it is for the people, after all, to correct by politics the evils of politics, and to elect, and retain as long as possible when elected, men who will look to their interests and try, by wise legislation, to advance them.

I have abstained as much as possible, in this dispatch, from theorizing. I have advanced in its stead such methods as have accomplished the results we are in search of abroad. Example is worth more than precept; we have the example, and all that remains for us to do is to follow it, to achieve like results. By adopting these simple methods, within twenty years it would appear as absurd to us that we ever sent abroad for a bull, cow, sheep, dog, or hog as it does now that we imported the English sparrow.

GEORGE C. TANNER,
Consul.

Agricultural shows held in England during the year 1883, exclusive of special society shows such as Shorthorn, Jersey, Carl-horse, &c., shows.

Date of show.	Name of society.	Where held.	Nature of meeting.
May 26 to June 1.	Agricultural Hall Company, Limited.	Agricultural Hall, Islington.	Horses, implements, and miscellaneous articles.
May 28 to June 1.	Bath and West of England and Southern Counties.	Bridgwater.	Horses, cattle, sheep, pigs, cheese, butter, poultry, and implements.
May 30.	Royal Jersey.	Jersey.	Stock, implements, &c.
May 31.	Eastern District of Stirlingshire.	Falkirk.	Stock, implements, dairy produce, and poultry.
June 8.	Stirling.	Stirling.	Do.
June 8.	Ripon.	Ripon.	Stock, poultry, pigeons, dogs, &c.
June 12, 14.	Herefordshire.	Hereford.	Stock, implements, &c.
June 26-28.	Royal Counties (Hants and Berks).	Winchester.	Do.
June 13, 14, 15.	Wirral and Birkenhead.	Birkenhead.	Stock, poultry, pigeons, dogs, &c.
June 13, 14.	Essex.	Colchester.	Stock and implements.
June 13, 14.	Peterborough.	Peterborough.	Do.
June 19, 20.	Marlborough and Pewsey Vale.	Newbury.	Stock, &c.
June 19, 20, 21.	Worcestershire.	Worcester.	Stock, implements, horses, hunters, &c.
June 20.	Thorne.	Thorne (Yorks).	Stock, implements, &c.
June 20, 21.	Royal Cornwall.	Truro.	Stock and implements.
June 20, 21.	Norfolk.	Eakenham.	Do.
June 21, 22.	North-east of Ireland.	Belfast.	Stock, implements, poultry, &c.
June 27, 28.	Doncaster.	Doncaster.	Stock, implements, dogs, poultry &c.
July 27, 28.	Suffolk.	Beeches.	Stock and implements.
July 27, 28.	Edinburgh.	Edinburgh.	Stock, implements, &c.
July.	United East Lothian.	Haddington.	Stock and implements.
July 5, 6, 7.	Notts.	Nottingham.	Stock, implements, &c.
July 16-20.	Royal Agricultural Society of England.	York.	Do.
July 6.	United Banffshire.	Banff.	Stock, implements, poultry, and dairy produce.
July 31.	Malton.	Malton.	Stock and implements.
July 17.	Stranraer and Rhins of Galloway.	Stranraer.	Cattle, horses, sheep, &c.
July 10, 11, 12.	Lincolnshire.	Gainsborough.	Stock, implements, and poultry.
July 13.	Bedfordshire.	Bedford.	Horses, stock, and implements.
July 19.	Royal Northern.	Aberdeen.	Stock, implements, poultry, and dairy produce.
July 21.	Huntingdonshire.	St. Ives.	Stock, implements, poultry, &c.
July 21, 23, 26.	Gloucestershire.	Berkeley.	Stock, implements, horticultural.

Agricultural shows held in England during the year 1883, &c.—Continued.

Date of show.	Name of society.	Where held.	Nature of meeting.
July 25.	Ormskirk, Southport, and Bootle.	Southport	Stock, implements, &c.
July 25, 26.	Leicestershire	Melton Mowbray.	Do.
July 25, 26.	Glamorganshire	Pontypridd	Stock, implements, and poultry.
July 21-27.	Highland and Agricultural of Scotland.	Inverness.	Stock, implements, poultry, and dairy produce.
July 25, 26.	Cambridgeshire and Isle of Ely.	Ely	Stock, poultry, implements, &c.
July 26.	Barnsley	Barnsley	Stock, poultry, dogs, &c.
July 26.	Cloveland.	Salthurn-by-the-Sea.	Stock, &c.
July 26.	Tyneside	Hesham	Do.
July 27.	Darlington	Darlington	Horse and dog.
July 28.	Western District of Fifeshire	Dunfermline.	Stock, implements, and poultry.
July —.	East Surrey	Croydon	Stock.
July —.	Driffield and East Riding.	No meeting for 1883.	Stock, poultry, pigeons, &c.
July 25, 26, 27.	Shropshire and West Midland.	Whitechurch (Salop).	Stock and implements.
July 26.	Yorkshire	No meeting for 1883.	Stock, implements, &c.
Aug. 1.	Crook	Crook	Stock, poultry, dogs, dairy produce, &c.
Aug. 1.	Norton Farmers' Club.	Chesterfield	Stock, &c.
Aug. 2.	Coquetdale	Rothbury	Stock, implements, and poultry.
Aug. 3.	Shropshire	Shifnal (Salop).	Stock, implements, &c.
Aug. 6.	Border Union	Kelso	Stock and implements.
Aug. 29.	Whitby	Whitby	Stock, implements, &c.
Aug. 8.	Badminton	Badminton	Stock.
Aug. 7, 8.	Staffordshire	Lichfield	Stock, implements, produce, and poultry.
Aug. 2.	Northumberland	Berwick-on-Tweed	Stock, implements, and poultry.
Aug. 15.	Beamish, Pontop, and Consett.	Gateshead	Stock, implements, dairy produce, poultry, and dogs.
Aug. —.	Inverness Farmers' Society.	No meeting for 1883.	Stock, implements, &c.
Aug. —.	Lauderdale	Lauderdale	Stock, implements, and poultry.
Aug. 6, 7.	Lismore Farming Society.	Lismore, County Waterford.	Horses, horned cattle, sheep, and swine.
Aug. —.	Herefordshire	—	Stock, implements, and poultry.
Aug. —.	Durham County	—	Stock, &c.
Aug. 20.	Richmondshire	Richmond (York).	Stock, implements, roots, &c.
Aug. 6.	Ecclesfield	Hillshorn Park, Sheffield.	Stock, &c.
Aug. 18.	Keighley	Keighley	Do.
Aug. 20.	Royal Jersey	Jersey	Stock, implements, &c.
Aug. 25.	Halifax and Calderdale	Halifax	Do.
Aug. 28, 29, 30, 31.	Royal Dublin	Gall's Bridge, Dublin.	Horses.
Sept. 12.	Wigton District.	Wigton	Stock, implements, &c.
Sept. —.	Vale of Conway	Llanrwst	Stock, implements, dogs, poultry, butter, &c.
Sept. 4.	Leominster	Leominster	Stock, &c.
Sept. 4, 5.	Warwickshire	Coventry	Stock, flowers, implements, &c.
Sept. 5, 6.	Derbyshire (agricultural and horticultural).	Derby	Stock, implements, roots, cheese, butter, poultry, horticultural machinery, &c.
Sept. 5-7.	Royal Manchester, Liverpool, and North Lancashire.	Liverpool	Live stock, implements, farm produce, dogs, poultry, &c.
Sept. 12.	North-east Somerset Farmers' Club.	Newton Park, near Bath.	Stock, butter, and cheese.
Sept. 12.	Wayland	Watton	Stock, &c.
Sept. 13.	Waterford Farming Society.	Waterford	Do.
Sept. 14.	Stanhope	Stanhope	Stock and implements.
Sept. 14.	London Union	Kelso	Ram sales.
Sept. 14.	Cartmel	Cartmel	Stock, dogs, poultry, crops, &c.
Sept. 14, 15.	Cheshire	Croft	Stock and implements.
Sept. 19.	Royal and Central Bucks.	Great Marlow.	Stock, implements, &c.
Sept. —.	Banbury	White Lion Hotel, Banbury.	Horses, ploughing matches, hedge-cutting, draught, &c.
Sept. 26.	Royal South Bucks.	—	Farm and garden produce, and ploughing match.
Sept. 26.	Frome District.	Frome	Cheese, butter, stock, and implements.
Sept. 28.	Oswestry District.	Oswestry	Stock, implements, butter, cheese, poultry, &c.
Sept. —.	Northwest Bucks and adjoining portion of Oxon and North Hants.	Buckingham	Cattle, sheep, cart and nag horses, pigs, butter, roots, and ploughing competition.

Agricultural shows held in England during the year 1883, &c.—Continued.

Date of show.	Name of society.	Where held.	Nature of meeting.
Sept. 21	Carmarthenshire	Carmarthen	Live stock, &c.
Sept. 12 and 13 ..	Northamptonshire	Kettering	Stock, implements, poultry, &c.
Sept. 18	Alferton Midland	Alferton	Stock, &c.
Sept. 18	North Lonsdale	Ulverston	Do.
Sept. —	East Surrey	Croydon	Field roots.
Sept. —	Bakewell Farmers' Club ..	Bakewell	Stock, poultry, cheese, butter, wool, &c.
Oct. 17	Chertsey	Chertsey	Roots and ploughing match.
Oct. 25	Ayrshire	Kilmarnock	Cheese.
Oct. 30	Inverness	Inverness	Seed grain, field vegetables, and potatoes.
Oct. —	Surrey	Epsom	Ploughing matches, roots, thatching, &c.
Oct. —	East Surrey	Croydon	Ploughing.
Oct. 9	Tring	Royal Hotel, Tring Station, L. and N. W. Railway.	Roots, dairy stock, sheep, pigs, corn, &c., and local exhibits of implements.
Oct. —	County Kerry .....	.....	Stock, implements, &c.
Oct. —	Royal East Berks .....	.....	Ploughing matches, roots, cottage garden produce, and awards to laborers.
Oct. —	British Dairy Farmers' Association.	Agricultural Hall.	Dairy stock and produce, goats, implements, poultry and pig-cons.
Oct. 31	Royal Jersey	Jersey	Stock, implements, &c.
Nov. —	King's Royal Root	Great Coggeshall	Roots and vegetables from seeds supplied by J. K. King.
Nov. 22, 24	Norfolk and Norwich	Norwich	Fat stock, poultry, roots, &c.
Nov. 29, 30	Chippenham	Chippenham	Stock, &c.
Nov. —	Stourbridge Root	No show for 1883.	Roots and vegetables from seeds supplied by Webb & Sons.
Nov. —	Metropolitan Root	No show for 1883.	Roots and vegetables from seeds supplied by James Carter & Co.
.....	Dumfries Root	No meeting for 1883.	Roots, vegetables, and plants.
Dec. 1-6	Birmingham	Bingley Hall, Birmingham.	Fat stock, implements, poultry, &c.
Dec. 7	Northern Counties	Inverness	Fat stock, poultry, roots, &c.
Dec. 11	Forres and Northern	Forres	Fat stock, implements, poultry, grain, &c.
Dec. 10-14	Smithfield Club	Agricultural Hall, Islington.	Fat stock and implements.
Dec. 13, 14, 15	Canterbury	Canterbury	Fat stock, roots, &c.
Dec. 18	Carmarthenshire	Carmarthen	Fat stock, poultry, dairy produce, sheep, dogs, &c.

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CATTLE-BREEDING AND DAIRY FARMING.

THE UNITED KINGDOM.

REPORT BY CONSUL-GENERAL MERRITT, OF LONDON.

THE DEVON.

The leading physical characteristics of the Devon breed of cattle may be concisely described as follows:

The Devons are comparatively short, but thick and heavy for their height; the carcass is cylindrical, and the skin has a beautiful touch to the hand.

The color is a pure, rich red, with fine silky hair.

The horns have a yellowish, waxy appearance, tapering and gracefully curved upwards and outwards. The head is small and well put on; the muzzle is very fine. The eye is clear, bright, prominent, and shows a good deal of the white round it.

The chest is very wide in proportion to the size of the animal. Legs are short, small, and very fine in the bone, and the animal altogether possesses a very neat and beautiful symmetry.

The Devon of all existing cattle breeds can lay claim to be one which had the greatest reputation for grazing character a century ago, when the Shorthorn, the modern Hereford, the Red Poll, and others had no existence. This is why that breed always stands first in the catalogues of the Smithfield Club and the Bath and West of England Society. The latter was formed in 1777, and the former before the last century closed, when the North Devon was the breed par excellence for small bones, and high quality, just as Bakewell's new Dishley breed was among the sheep tribes.

The history of the Devon can be traced back until lost in obscurity, and Youatt no doubt rightly deems it to be one of the best existing representatives of the original British breed of cattle. In modern times Shorthorns and Herefords have become more popular with rent-paying farmers throughout the Kingdom, generally because they get the larger size and feed to much greater weights. Still they have failed to supplant it in different parts of England, comprising Devon, their native county, parts of Somerset, Cornwall, Dorset, and Hants. In the two last-mentioned counties, where bites of grass are often short, they are better adapted for dairy herds than the Shorthorn, and probably its popularity with rent-paying farmers in the fertile vales of West Somerset is greatly enhanced by the possession of a variety termed the Somerset Devon, which, although not of quite such high quality as the true North Devon, appear to answer the combined purpose of dairying and grazing far better. As a dairy animal the Devon has always been celebrated, not so much for large quantities as for the rich quality of the milk. At the London Dairy Show for 1883, a Devon cow belonging to

Mr. A. C. Skinner, of Bishop's Lydiard, gained second prize in the milking trials, and it was found that there was a greater proportion of solids to its milk than to that of the Jersey and Guernsey cows, which won prizes.

A sufficient reason for their being preferred to Shorthorns in Somerset was recently afforded by a large farmer near Ilminster, accustomed to let as many as one hundred and fifty cows a year to what is termed a "dairyman." He said that the rent paid for his cows was £13 per year, and that his neighbor, who let Shorthorns, could obtain no more. Further, that when barren, although his cows only fed on an average to thirty score pounds weight of carcasses, and the carcasses of his neighbor's Shorthorns averaged thirty-six score pounds, owing to superior quality he was usually enabled to make quite as much money of the lesser weights as his neighbor of the heavier.

It has always been claimed that a Devon yields a larger proportion of roast meat at the best joints than any other beast, and perhaps there is none yielding a smaller proportion of offal to the carcass. In responding to very early maturity it would scarcely compete with the Shorthorn or Hereford. This will be sufficiently seen by investigating the scale of animals exhibited at the Smithfield Club cattle shows. The heaviest in the class under two years old in the display made last December was the one year nine months old steer belonging to the Queen, the live weight of which was 10 cwt., 2 qrs., 10 lbs., whereas the reserve Hereford of Mr. J. F. Hall, only one year, six months, three days old, scaled 12 cwt., 20 lbs. In fact the prize winners in the Hereford class averaged nearly 14 cwt. each, but they were older.

THE HEREFORD.

The Herefords are remarkably good feeders, laying on flesh abundantly in proportion to the amount of food consumed, and their aptitude to fatten is favored by their general placidity of temper. They come early to maturity, whilst the beef is well mottled or marbled, fat and lean, and is highly prized. The prevailing characteristics are as follows:

White face, throat, chest, udder, dewlap, mane, lower part of body and legs, and tip of tail; the other parts of the body red; frequently a small red spot on the eye, and a round red spot in the midst of the white on the throat.

The body is covered with long soft glossy hair, with a tendency to curl. The horns, which are beyond the medium length, are tapering, and have a yellow or white waxy appearance, frequently dark at the ends. Those of the bull spring out straightly from a broad flat forehead, whilst those of the cow or ox usually have a graceful wave with a slight spreading upward tendency. The eye is full.

The chest is expanded, full, and deep, and projecting firmly; the ribs are well sprung; the back is broad and legs short, indicative of the hardness of constitution for which these cattle are esteemed; the bone is small, and the offal is light. The Hereford crosses with almost any breed, and imparts an aptitude to fatten.

The Hereford breed is an old race, which can be traced back at least a hundred years. The best herds may, no doubt, be found in its native county, where the white faces are to be found on almost every farm. Shropshire also "swears by them," and they have extended themselves largely into Wales, notably into Glamorganshire, and the border county of Monmouth. Of late years they have made their way much further afield than formerly, and their wealth of flesh would no doubt cause them to be more generally popular if possessed of a higher reputation for dairy purposes. Still the latter faculty can be cultivated, and, strange to say, not only is the cross of a Shorthorn and Hereford a pro-

verbal deep milker, but the slightest dash of the former seems to bring out the latent lactical fertility of the Hereford.

Mr. E. C. Tisdall some few years since published in the British Dairy Farmer Association's Journal a record of the milk yields of sixty of his most famous milkers, and the best of them all was a cow called "Old Hereford" which answered to the latter description. Mr. Tisdall supplies the Kensington district at the West End of London with milk and butter, and keeps a large herd of dairy cows.

Herefords have always been deemed better for the dairy in Dorset and Somerset than in their own native county, because probably they are more educated to serve that purpose. The breed has extended into Cornwall, and Mr. Lewis Lloyd has cultivated it in Surrey within six miles of the metropolis. At the last Smithfield show he gained second and third prizes in the class of steers under two years old, one of his animals weighing 14 cwt. 20 pounds when only a day under the two years' limit. There used to be three distinct kinds of Herefords, the mottle faced, the gray, and the white-faced red, which latter being smaller in bone than the former, has well-nigh everywhere supplanted the other two.

The uprise of the breed in celebrity may be considered contemporaneous with the Smithfield Club shows, which very much promoted it, for Mr. Westear won first prizes for oxen at the first Smithfield show in 1799, and continued to do so at the London shows for twenty years. In fact the Smithfield show record from 1799 to 1834 gives the premiums won by the Herefords as 88, more than double those of any other breed. The Hereford is no doubt an extraordinary grazer, and being likewise of great constitutional vigor and famous for possessing broad, deep, compact forms, there can scarcely be any wonder why it has become so great a favorite in the western prairies of America or in Australia and New Zealand. In a general way the cattle feed to good medium weights—not quite so heavy as some Shorthorns perhaps, but very much more so than the Devon.

THE SHORTHORNS.

The physical characteristics of the Shorthorn breed may be described as follows:

As the name indicates the horn is short, semicircularly curved, and rather flat. The color of the animals varies from a white to a yellowish tinge of white, some are red, others red and white, and sometimes the white and red are blended, forming a beautiful variegation called "roan," formerly strawberry color. The head is handsome, intelligent, and the expression docile; the eye is bright and full; the ears are thin and fine, well covered with hair; the neck is short, carrying the head gracefully, and springing straight from the back, which is also straight and broad and round. The ribs arch roundly from the backbone; the hips are well covered and not very prominent; the hind quarters are long and full to the tail, which hangs straight and square from the body; the thighs are full and deep and broad; the legs are short and straight, the under line is even; the shoulders are well laid, oblique, and falling well on the body, so as to form a round deep chest with a full swelling bosom; the udder is large and soft, coming well forward, and the teats hang squarely from it. The body is well covered with fine soft hair, and the hide is mellow, with a rich appearance indicating the excellent quality of the beef. Altogether the animal, owing to the evenness with which it lays on its flesh, forms nearly a parallelogram; its strong constitution makes it adaptable to all soils and climates, and its excellencies are so great that its admirers claim for it the title to be placed as the first of our national breeds.

Shorthorns are more generally propagated than any other British breed of cattle, although scarcely known beyond the valley of the Tees before the commencement of the present century. Their original name was *Tessaler* or Durham cattle, and they are still known more as Dur-

ham than Shorthorns in many parts of the Continent. At one period there was an apprehension that the Scotch climate would be unsuitable for them, but this has long since been dispelled, they being quite as generally kept in many of the Scotch lowland districts as the native polled cattle, whether Angus or Galloway. They also flourish almost at the Land's End in the contrary direction, as is sufficiently proved by the splendid specimens Messrs. Hoskins & Sons are accustomed to bring from Hayle to the Royal, and Bath, and West of England shows.

After the dispersion of the herds of the Brothers Colling those of the Booths at Studley Warlaby and Killerby came into reputation, together with that of Thomas Bates at Kirklevington, all in North Yorkshire, not far distant from the original locality of the breed's first origin. But Shorthorns had early popularity in Lincolnshire and Lancashire, and the old red variety of the former county is still famous in some districts for health, good size, and constitutional vigor. The successors of Professor Towneley's Lancashire herd twenty years ago were creditable to that county, and it was close to Lancaster that Mr. Bolton had his famous herd.

At the present day the Duke of Devonshire at Holker eclipses all others so far as the county is concerned, and the Bates men pay a pilgrimage from one end of the Kingdom to the other. The Earl of Latham has a celebrated herd of fashionable Bates cattle at Ormskirk. But it is almost impossible to single out any quarter of the Kingdom where there are not herds of Shorthorns of high reputation, from those of the Earl of Beville, Mr. S. B. Foster, and Mr. Handley, in Cumberland and Westmoreland, to those of Lord Fitzhardinge, Colonel Kingscote, and Mr. St. John Ackers, in Gloucestershire; from Lord Penrhyns, in North Wales, to Mr. Hugh Aylines, in Norfolk. Throughout the Midland dairy districts large Shorthorns are bred, which are deep milkers, and a perfect revolution in Irish cattle has been effected by the agency of the Shorthorn.

Less than half a century since Irish cattle were a by-word and a reproach on account of their big bones, tough hides, and unthrifty character; but now the young cattle that come to the English grazing districts in such large multitudes are well nigh equal in quality to Shorthorns bred in England, and the big Norfolk and Suffolk graziers are accustomed to depend almost entirely on them for a supply of their raw material, they seldom being accustomed to breed their own. The youngest class of Shorthorns at Smithfield last December scarcely gave such heavy weights as the corresponding Hereford class, the heaviest being the one-year, ten-months and two weeks' old first prize steer of Mr. Hugh Goringe, weighing 13 cwt., 3 qrs, 4 pounds. The Shorthorns exhibited on that occasion were, however, generally much heavier than the Herefords, Mr. Herbert Leney's third prize six-year old cow scaling 21 cwt., while the Earl of Coventry's giantess eleven-year-old Hereford, which had previously won several royal prizes, scaling 20 cwt., 3 qrs., 2 lbs.

THE LONGHORNS.

The Longhorn cattle may be described as follows:

The horns fully bear out the name of the breed: they grow in such a manner as to be very distinctive; they curve forwards and hang down towards the muzzle, and sometimes actually grow so much inwards as to touch the cheek.

The color is generally dark red, brindled, and pied, with white along the backs. The coat is good and the back straight. The females are very broad in the hips and are good milkers. Many of the cross-bred milch cows in various parts of England show they have a dash of Longhorn blood in them.

There are, however, but few herds of this variety now kept.

It crosses well with other breeds.

The Longhorn breed deserves to be considered next on account of its antiquity, as at the early part of the century more *Longhorns* were kept than probably any other leading breed of cattle, chiefly because it was then considered to be the best dairy breed and was extensively adopted as such in the Midland counties.

It seems singular that the great Bakewell should have prized it so highly, considering that the bones are large and the hides thick of even the better specimens. For deep milking *Shorthorns* of the right kind excel them, but it has been demonstrated of late that *Longhorns* can be greatly improved, and highly meritorious specimens have been brought to the showyard by the Duke of Buckingham and several other breeders, chiefly from the Midlands.

The original breed of *Longhorns* appears to have sprung from Yorkshire, thence to have subsequently receded to Leicestershire, Warwickshire, and Derbyshire in which counties they are now most numerous.

THE NORFOLK AND SUFFOLK POLLED CATTLE.

The breeders of these cattle have determined on the following characteristics, which they should possess :

The color red. Tip of the tail and udder may be white, and the extension of the white of the udder a few inches along the inside of the flank, or a small white spot or mark on the under part of the belly by the milk veins shall not be held as disqualifying an animal whose sire and dam form part of an established herd of the breed, or answer all other essentials of the standard descriptions.

There shall be no horns, slugs, or abortive horns.

These cattle are known in the counties of Norfolk and Suffolk as the *Red Polled*. Among the good qualities which they possess is hardness of constitution, which enables them to thrive on scanty pasturage and to withstand the severe winters and cold springs usually experienced in the eastern counties of England.

Their milking properties are unquestionable, as they have not a tendency to go dry like many other breeds having a reputation as dairy cattle, and it not unfrequently happens that the cow will continue to yield a good quantity of milk from one calving to another.

No doubt the present *Polled* breed was the result of a cross with the *Galloway* cattle, large numbers of which were formerly brought into the eastern counties to be grazed. The tuft of hair growing downwards on the forehead is common to both breeds, whilst occasionally a black nose, a "slug" horn, or a spot of white on the face, or, more frequently, on the udder or belly, gives an indication of the original blood.

The breed does not mature early, and is rather diminutive in size. The heaviest specimen at the late Smithfield Club show was Mr. Alfred Taylor's ox, by King Charles, which, within a day of four years-old, scaled 17 cwt., 3 qrs., and 6 lbs., and Mr. R. E. Loft's eight-year-old cow, which was reserved in the female class, closely approximated to this weight, being 17 cwt., 2 qrs., and 24 lbs.

THE SUSSEX CATTLE.

The *Sussex* breed was formerly used in place of horses for plowing and heavy work. They were very active and well suited to such purposes; however, of late the working of oxen has decreased in a marked degree, and the breeders of *Sussex* cattle have turned their attention to the improvement of the animals with great success. They resemble the *Devons* in many respects, but are larger. Formerly they were not,

as a rule, grazed till after they were done with for working, but now they are got to early maturity and produce good beef. In fact, they are so much refined that they are considered by many to approach very closely to the Hereford in wealth for grazing purposes.

At present the breed is restricted very much to the country that gives it name and the two adjoining ones of Kent and Hants.

The cows are not good milkers. They are very hardy, however, and do well on poor pastures. Like the Devons, they are all red, but have larger horns, heads, and bones.

There was an admirable class of Sussex steers under two years at the late Smithfield show. Mr. Dunnett's one year ten months and two weeks second prize one weighed 13 cwt., 2 qrs., and 25 lbs., and one, about a fortnight older, belonging to Mr. H. Page, of Walmer, Kent, weighed 13 cwt. and 3 qrs. The heaviest Sussex ox was that of Mr. S. Clarke, not quite three years and ten months old, which scaled 20 cwt. and 1 qr. The third prize cow, however, belonging to Mr. W. Wood, of Crawley, Sussex, weighed 5 pounds over a ton.

THE SCOTCH POLLED ANGUS OR ABERDEEN.

This breed of cattle is supposed to be descended from what were formerly termed "Angus Doddies," or Aberdeen Hummies. It is largely represented in Aberdeenshire, Forfarshire, and Kincardineshire, and their leading characteristics may be described as follows:

Their coat is short, smooth, silky, and glossy, and almost always black, though occasionally some animals have small dull white spots, and still more rarely some are red or brindled. The head is tufted with hair, the ears are rather thick and hairy, the muzzle is somewhat coarse, the legs are well boned, and of moderate length.

Great improvement has been made of late years in this breed by careful selection, and very beautiful animals have been exhibited at both breeding and fat-stock shows.

They are poor milkers, but are very hardy, docile, large, coming early to maturity, and good breeders, and the meat is of excellent quality. In respect of wealth and high quality combined, for grazing purposes they can scarcely be surpassed by any variety whatever, the Scotch graziers appear to think, the only notable preference on their part being for a cross between them and the Shorthorn. Mr. C. Stevenson's first prize three years eight months old steer at the last Smithfield show scaled 21 cwt. and 23 lbs. This was by far the heaviest exhibited. There was, however, a great uniformity of weight between 16 cwt. and 19 cwt.

THE GALLOWAY BREED.

The Galloway breed is much older and quite as highly prized as the Angus in the county of Galloway and many parts of Scotland. They were formerly partly horned and partly polled, but by selection they have now become polled, though occasionally some have small "slugs" or stumps which are not affixed to the skull.

This breed is more hardy than the Angus, and better for dairying purposes, while its claims are also admissible for wealth as a grazer. It is in fact a serviceable all-around tenant farmer's animal. The veteran McCombie, who stood first and foremost among Scotch graziers, wrote as follows in his book on the feeding of cattle:

I have grazed the pure Aberdeen and Angus, the Aberdeen and North Country crosses, the Highland, the Galloways, and what are termed in Angus the South Country cattle, the Dutch, and the Jutland. If store cattle of the Aberdeen and Angus sort out of our best herds can be secured, I believe no other breed will pay the grazier more money in the north for the same value of keep.

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Mr. McCombie considered that the Galloways "on poor land are unrivaled except perhaps by the small Highlanders," but he did not deem them so easily finished as pure Aberdeens or cross-bred cattle.

The pure Galloway is usually black; the eye is rather dull and sleepy; the ear is thick and very hairy; the back is straight; the head is covered with a semi-spherical knob, tufted with hair; the legs are short and strong.

HIGHLAND CATTLE.

As the name denotes, this breed is native to the West Highlands of Scotland; they were formerly known as North Ayrshire cattle. The characteristics may be described as follows:

Their stature is usually somewhat small. They are clothed with a thick skin, having abundance of long, glossy, and shaggy hair, indicating hardness of constitution in the highest degree. This thick coat is a protection against the atmosphere of winter and from flies in summer. The color varies, some animals being black, others red, dun, yellow, and brindled (red and black). The head is short, and has a profusion of long shaggy and curly hair coming down below the eyes. The muzzle is fine, and the nose slightly turned up.

The eyes are prominent, and have a quick, piercing glance. The horns are wide apart, long, curved, and pointed; the body is straight, thick, very deep, compact, and well formed.

The legs are short and extremely muscular.

They are celebrated for their grazing properties, the meat being of the finest quality, and comes down to the very bone. It commands the highest prices in the principal English markets. For dairy purposes they do not rank so highly, because the milk, though good in quality, is deficient in quantity. They are extremely hardy, vigorous, quick, and active, and capable of enduring both the damp and cold boisterous climate of the Highlands. They thrive admirably on low lands, where they are generally fattened, and are in great demand in England for grazing. Their hardy nature does not require that they should be housed, and they will consume and thrive on coarse pasture, which sheep and many other kinds of cattle would leave untouched.

It is best to graze them for a time before putting them to fat, as they require being gradually accustomed to yards or boxes. Of late years much care and attention has been paid to improving the breed, and frequently handsome animals are exhibited at fat-stock exhibitions; whilst both on their native hills, where their appearance is somewhat wild, and afterwards when being grazed in pastures, their picturesque beauty is always highly appreciated.

The attributes of this breed may be summed up as a combination of great hardiness with splendid quality of meat.

AYRSHIRE CATTLE.

This breed takes its name from the county of Ayr and possesses the following characteristics:

Their color is usually red or brown and white, in large patches; or all red or brown, and sometimes black and white.

The horns are fine, curve upwards and are placed on wide apart at their base. The neck is straight from the head towards the top of the shoulders, which are very thin on the top; the back is straight.

The body becomes larger, both in width and depth, as it approaches the hind quarters. The tail is long, fine, and bushy at the end. The legs are short and small in the bone. The eye is mild and the udder very large.

Its origin is not thoroughly known, but for a considerable time breeders have taken pains, by selection and judicious breeding, to im-

crease the properties for which Ayrshire cattle are famous, and which are in a degree indigenous.

These animals are so hardy that they bear almost any variation of climate, thriving well on high-lying districts without losing their milking properties, whilst a milder atmosphere and rich pasturage suit them perfectly.

Their great attribute is their excellent milk, which is good in quality and extraordinarily large in quantity. It is claimed that a cow of this breed will yield as much milk for food consumed as any member of the bovine species.

Ayrshire cows are very popular in their native county and throughout the dairying districts of Scotland, partly because they suit the systems of farming adopted much better than heavier cows, such as Short horns, would do, for the feeding is very much restricted to the arable portion of the farm, the land being kept down to artificial grasses two years that dairy cows may be kept. The chief objection against Ayrshires in England is that when the cow has ceased milking it is worth very little for grazing purposes.

JERSEYS AND GUERNSEYS.

The same objection as the foregoing applies in a still greater degree to the Jersey. Still there are pastures with short bites in the south of England for which Jersey herds are adopted even by tenant farmers. As a fancy animal for noblemen's parks, and to adorn the grounds of our country gentry, Jerseys are very much extending themselves everywhere. They are not only affluent milkers, but the proportion of cream to milk is large, and the yields of butter realized from some are remarkable. A great many good herds are to be found in Hants, and indeed all along the southwestern coast, also in Essex and the home counties.

The Jersey cow is too well known for its neatness of form, slender frame, its deer-like head, and its gentleness to require further description.

The cows of the sister isle, Guernsey, are celebrated for yielding more butter than even Jerseys. They are also larger in size and more hardy, still they seldom yield carcasses to the satisfaction of English renting farmers after their milking season is over. The same parts of the Kingdom where Jerseys are found most numerous patronize the yellow Channel Islands breed.

The best English show-yard herds of Guernseys are probably from Hants and Devon. In propagation the Guernsey in England seems naturally to develop into more grazing character, and detract somewhat from fine quality, or at least what would be considered so in the eyes of an island judge.

Jerseys and Guernseys were for a long time accepted in England under the general title of "Alderneys," the probability being that they were first introduced from the island of that name. It is only lately that the difference existing between them has become generally known.

In both islands the entry of foreign stock for breeding purposes is prohibited. The law enforcing this has been long in existence, and most rigidly observed; this accounts for the purity of the breeds in these islands.

The animals are narrow between the shoulders, have short smooth coats, and the eyes have a mild, docile expression. They are healthy, breed well, and last long. The principal malady to which they are subject is milk fever, which, if prompt measures are not taken, proves a sure destroyer.

WELSH CATTLE.

The Welsh Runts, as they are sometimes called, may be considered as an aboriginal breed, but they have been found to vary very much in quality. This arose from sufficient care not having been taken formerly in selecting them for breeding.

They are apt to be somewhat rugged in outline, though fairly good specimens are occasionally found, especially of late, as more attention has been given to form and quality.

They may be denominated a middle-horned breed, rather inclined to long. The horns are wide-spreading, white, tipped with black, and curling upwards.

The color of the animal is usually black, and some have a little white.

They are good for dairy purposes, but are usually too strong in bone and hide for grazing profitably. Still, in the hands of a few leading breeders, they have become so much refined of their coarseness that they begin to make an impression at the Smithfield Club show, and last December Mr. Owen Thomas, of Anglesey, could claim to have the heaviest animal in the show with his nearly four years old ox, which weighed 22 cwt., 1 qr., 6 lbs.

The Welsh Cattle Book, published in 1874, gives the characteristics of this breed most fully.

KERRY CATTLE.

The Kerry is the only native Irish breed worthy of mention. The cows are good milkers for their size; from the ease with which they are kept in a limited space they are often called the poor man's cow. They are small, headsome, and very docile; the head is fine and small, the eye quick and animated. Frequently the animals do not exceed 40 inches in height.

The foregoing succinct and detailed references to the various breeds of cattle furnish general descriptions that may be unreservedly accepted, the printed notes being those made by the current president of the Royal Agricultural Society of England, Sir Brandreth Gibbs, who has had forty years' official connection with the Royal Society and the Smithfield Club, whilst the written account has been specially compiled for me by Mr. Joseph Darby, an author of works on cattle, sheep, and dairy subjects, well known and esteemed in this country.

Herewith I inclose the various items of information which I have obtained in response to letters addressed to several of the leading stock-owners of the British Islands, and from personal visits made by myself, especially in Essex and Norfolk. I shall, however, wish to make the following preliminary remarks on the whole subject:

SELECTION OF FOREIGN CATTLE FOR THE UNITED STATES.

In reference to the assertion that there are only ten or eleven breeds of cattle in the United States, where there is room for at least thirty, and that England possesses twenty breeds and France fifteen breeds and other European countries in like proportion, I would observe that whilst doubtless some additional breeds to those at present in the United States may be advantageously introduced, yet the cattle now in the United States are selections from the best breeds of Europe, where stock-breeders are reducing the number of their breeds, so that those best suited for the production of meat and milk are crowding out the inferior

breeds very rapidly. Thus the restriction of breeds to small numbers infers the "survival of the fittest," and is indicative rather of agricultural progress than the reverse. For the future it may be forecast that the European breeds of cattle, sheep, and pigs will notably diminish in numbers and correspondingly improve in value.

The paragraph referring to imported breeds producing in their new homes, when suitably located and managed, offspring superior to that produced in their original homes can only be accepted with reserve, as although numerous instances of great breeding successes are established in the records of the United States, that result may be attributed to the fact of the imported cattle and pigs being generally picked specimens, selected for their excellence, whereby their progeny are put out of comparison with the more ordinary stock from which specimens are commonly seen at the shows of the United Kingdom.

I am advised by eminent authorities that however grand may be the American results attained in the case of Jersey cattle &c., yet it is thought to be advisable to replenish stock by returning to the original homes of the breeds, whilst I note also in a report relative to Shorthorns from our consul at Leeds, that buyers are recommended to revisit the Teeswater districts, where the grand old Durham stock, renowned for its size, good constitution, and splendid milk-bag, exists in large numbers, and from which the refined, improved Shorthorn has been carefully bred.

So also in respect to French breeds I feel assured there is a wide scope for importation of superior cattle from their native districts, from which, the best specimens being selected, it may be expected the American continent will soon produce a higher general level of excellence in such new breeds than could be found in France. Besides the Norman, Brittany, Flemish, and Charolaise breeds, there are quite half a dozen French breeds of cattle which probably might be advantageously introduced into the United States.

Your attention is called to inclosure "Notes on French Live Stock," from the official French catalogues of the Paris Exhibition of 1878, with illustrations added which do not appear in the original catalogues; also to the critical report of the last Paris cattle-show (February, 1883), written by Mr. Kains-Jackson and published in the London Times and the Field (inclosure 2),* which gives the most complete description ever published here.

PUBLICATIONS CONCERNING BRITISH CATTLE.

The detailed information sought as to the costs and methods of exportation, the critical descriptions of the several breeds, their relative numbers and relative production for meat or milk would require, even in a most condensed form, a volume of several hundred pages. Such a work would not be difficult to compile from existing materials and from the special supplementary details now obtained, especially as in recent years great activity has been shown in Great Britain and Ireland in applying authentic matter for the compilation of stud and herd books.

The Suffolk Stud-Book, the Carthorse Stud-Book, and the Jersey Herd-Book have lately appeared, and now the Devon Herd-Book, the Cleveland Bay Stud-Book, the Hackney Stud-Book, the Pig-Breeder's Stud-Book, and other similar works are in course of preparation.

The Shorthorn, Hereford, Scotch, Polled, Red Polled Ayrshire, and Welsh Black Cattle Herd Books have been established for several years.

* See Supplement.

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and each of these may be readily obtained, and should be consulted as affording the most valuable information extant on the various subjects. Careful illustrations of the various breeds, critical notes on their stand-ard points in these works convey a correct knowledge of the animals, and nearly all the written information that individual reports may contain will have been in most cases drawn from the sources above indicated.

Herewith I forward (inclosure 3) a useful small dictionary volume, by the Rev. Holt Beever of the several tribes of Shorthorns. I also forward as a most successful work (inclosure 4) a large folio volume on the Cattle of Great Britain, containing several illustrations and with descriptions written by authors selected for their knowledge of the sub-jects; and also a volume (inclosure 5) entitled "The History of Polled Aderdeen or Angus Cattle," by Messrs. James Macdonald and James Sinclair, which is a valuable and most complete work, exhaustive of the subject.

In the volumes of the Royal Agricultural Society of England, since 1840, are found the Prize County Histories of the country, in which are given an account of the geological subsoil, the surface soil, rotation of crops, pastures, elevation and aspect of the land, of breeds of stock and methods of feeding and rearing them. Such histories were written in response to prizes offered by the Royal Society.

The Farmers' Hand-Book (inclosure 6) herewith forwarded contains notes on the Royal Society, the Smithfield Club, and various other leading societies. Here may be observed that the several prize lists of the great agricultural shows give the names and addresses of the chief stock-breeders in the country, although exceptionally some of the most renowned breeders do not exhibit, as their stock enjoys celebrity for its excellence that commands the highest prices at home and abroad.

PRIZE VS. ORDINARY STOCK.

In the matter of prize cattle, whether for size, weight, quality of flesh, milk, wool, smallness of offal, &c., it is well to remember they are always exceptionally chosen animals, reared and fed under favorable circumstances, and are not representatives of the total number of farmers' stock which is not usually of a pedigree character. For this reason the weight of meat, or the quantity given of milk, have to be regarded simply as instances of special rather than of general excellence. Still, I may make comment that the differences between prize results and ordinary results are not enough to induce the ordinary farmer or dairyman to purchase stock at fancy prices; and the same argument applies to purchases from abroad. However, when the object is to establish herds or flocks of repute, only pedigree stock should be bought.

GEOLOGICAL CHARACTER OF THE BRITISH ISLES.

The geological character of the British islands, their insular climate, and the small altitude of the land are best described in special works on the subjects, and agriculturists afford but little information. The up-land pastures and what are called mountain districts are inconsiderable in comparison with the lowland grazing districts, valleys, and marsh lands of only 50 to 500 feet above sea-level; and of Great Britain generally it may be said that the various breeds of stock may be changed from district to district without losing their character. Shorthorns thrive everywhere, yet the north of England well holds its character as the home of the race. Devons fattened in Norfolk often surpass those

fed in their native county, and Cotswold sheep also thrive in various counties. Southdowns, Oxfordshire downs, and in fact nearly all the breeds of stock in the British Islands allow of interchange, district with district, without losing their character; from which the fact may be inferred that the diversities of altitude and climate are insufficient to affect stock materially in Great Britain.

THE SANDRINGHAM HERDS.

The inclosure 7 is a return with which Mr. Samuel Beek, agent to the Prince of Wales, favored me. It will be observed that all the stock are managed, pedigree Shorthorns, Alderneys, Black Polls, and other cattle, in a manner that a tenant farmer might profitably follow. Of this I had the opportunity of assuring myself by a visit of inspection which I made in the middle of the present month, devoting several hours to a survey of the farms, their buildings, stock and general character, and being favored with personal explanations from Mr. Beek, and from his son, Mr. Frank Beek, whose minute acquaintance with every agricultural detail was of the greatest advantage to me. The parade of the pedigree stock in the several exercise-yards, and the groups grazing in the open pastures formed a "royal show" in private of the most interesting character, being free from the turmoil and crowded surroundings under which stock are commonly seen at agricultural shows.

The herds of Shorthorns, at Sandringham, are located upon two distinct farms at Babingley and at Wolferton, 2 miles apart. The one herd of the "Bates and Knightly" blood is kept separate from the herd of the "Booth" blood, and admirers of either have thus an easy opportunity of noting the respective points.

Some years ago the following words were written by a competent critic of Norfolk farming:

It is nothing but a plain truth to say that Norfolk farmers needed a sound lead to follow in the matter of live-stock management, and there is one to be found at Sandringham, thanks to the management of the Prince of Wales.

The bulls of the Wolferton herd include the Admiral, Baron Wolferton, Beuchamp, Denmark, Downham, Dunkirk, Fortis, Fraternas, Gamester, Marias, Ponsapo, Pluto, Royston, Samson, and Viscount. Their ages are from twelve months to six years. Amongst the cows are fifteen Diadems, the offspring of Mr. Fisher's bull (Fawsley Prince, 31,150, and Diamond, by the Chieftain, 20,912). Amongst the Babingley herd is the bull Babingley Duke, 42,680, with the best of Mr. Bates's blood. Through all the mazes of the Wild Eyes family, dam Blythesome Eyes, sire Marquis of Oxford 2d, 37,055, the bull Duke of Norfolk, calved June 13, 1880, and bred at Sandringham, is by the Earl of Beetive's Duke of Underly 3d, 38,196, and Fuchsia of Hilhurst.

Considering the size of the farms, their carrying a pedigree herd of about 30 bulls and 80 cows, besides numerous store-stock of Devons, Black Polls, Highlanders, and dairy cows, they bear witnesses to economy of management and productive capabilities which are astonishing in an estate that was "nowhere" twenty-five years ago, and which has since 1863 been made into a most picturesque domain and fertile land. Even the miles of evergreen trees, mostly Scotch firs, giving Sandringham a moorish appearance, were planted by Mr. Beek, and in the very hot season of 1868.

The farm buildings were mostly the old farm structures, merely kept in good repair, and here and there improved by economical additions.

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I saw no costly outlay anywhere, neither in barns, sheds, stables, or fences at Sandringham.

Many of the animals of the Prince of Wales's herd are obtainable at fixed prices that are so moderate that any farmer may invest in them, and, compared with the prices asked in similar first-class herds, it is evident that Sandringham, as a source of good Shorthorn blood, is meant to be a fertilizing stream for farmers at home and abroad. The "Diadem" strain is a valuable one for its milking qualities, some of the cows giving two gallons when out on grass. The herd of cows out in the open Wolferton marshes were looking, on the 17th of January, all in healthy condition, noticeably so considering the slight attack from foot and mouth disease from which all had suffered. The Babingley herd, only 2 miles distant, had entirely escaped. The hardihood and general condition of both herds witnessed to the good stamina of the stock, and whilst the Babingley farm is in soil, situation, and general character only a good average one, the Wolferton low levels, wind-swept and marshy, are as exposed and cold as can be any quarters to which the stock are likely to be moved.

The Sandringham Shorthorn herds represent the best of the blood in the kingdom. Its stock is drawn from the herds of the Duke of Manchester, the Earls of Dunmore, Feversham, Bective, of Lord Fitzhardinge, of Colonel Kingscote, and of Messrs. Bowly, Darling, Hamer, Samuda, Sartoris and Tracey, as representing the Bates blood; whilst the Booth blood is represented by the herds of Her Majesty the Queen, the Rev. J. N. Micklethians, and Messrs. Hugh Aylmer, H. D. Barclay, A. H. Browne and J. Gamble.

The pastures are often of that good grazing character called "bullock-pastures" of the old mixed grasses and adapted to fattening stock. In this direction the Prince of Wales has often been successful, and there are now in the yards some Devon, cross-bred Black Polls, and two Highland cattle that may be expected, in 1884, to be in the front rank at fat stock shows.

From the responses to my circulars requesting information I extract the following:

THE DUFFRYN HERD OF SHORTHORNS.

Mr. R. Stratton writes relative to his "Duffryn Herd of Shorthorns" (inclosure 8):

History of the Stratton herd.—My herd was founded by my father in 1837, by the purchase of Phoenix (6,290), which had been bred by Mr. Bellamy from the stock of C. Colling, and was the sire of Moss Rose, calved in 1838, whose progeny may be said to have made the reputation the Stratton Shorthorns may claim. It has been computed that they have won not less than £10,000 in prizes. The dam of Moss Rose was a cow of good Shorthorn character and an excellent milker. She was purchased on the market and her pedigree was unknown. The herd has always been managed with a view to produce stock combining good milking and feeding qualities; with what success the records of the Smithfield Club, the London Dairy Show, the Dairy Classes of the Royal Agricultural Shows attest. At the Smithfield Shows they have won more champion prizes than all other Shorthorn tribes put together.

In my father's time the herd was kept for many years on the Wiltshire Hills; my mother's herd at Alton Priors was also kept at a very considerable elevation, some 300 feet above the sea, and proved remarkably hardy. They have always been bred chiefly in the open fields all through the winter with only straw or rough sods besides the grass of the pasture to eat. These Shorthorns are as hardy as any domestic breed, and when Shorthorns have been objected to, on the ground of delicacy, they have become so from the system of "in and in breeding" largely practiced by breeders in this country.

My herd is now, for the most part, kept at the Duffryn, Newport, Monmouthshire, where the soil varies from gravel to old red sandstone. The cattle do well on either. Heifers are generally brought to calve at about thirty-three months; bull calves are generally allowed to suck their dams, whilst heifer calves are taken from the cows and reared with only a little milk, as it is considered that too generous feeding is injurious to the milking qualities.

Milking qualities.—I can give no details as to the annual yield in milk per cow per annum, having never kept any record, but Sir H. H. Hassey Vivian, Bart., M. P., has two cows of "Stratton" blood that have given over 1,000 gallons of milk within the year.

Size and weight.—As to size, two of my biggest cows, in good, fair condition, I find to measure as follows: Chloe, girth, 7 feet 4 inches; length, 7 feet 5 inches; Heather, girth, 7 feet 5 inches; length, 7 feet 7 inches.

I have had a heifer increase as much as 672 pounds in twelve months.

As to relative live and dead weight, two of my champion Smithfield heifers have been as follows: Icicle, alive, 19 cwt., 9 pounds; dead, 1,674 pounds. Wild Flower, alive, 17 cwt., 2 quarters, 9 pounds; dead, 1,420 pounds.

I do not consider the cows fully matured until six years old.

Shorthorn crosses.—Shorthorns are far superior to all other breeds for crossing purposes, and it is a notable fact that two or three crosses of good, pure blood upon any inferior nondescript stock will often stamp the progeny as pure-bred Shorthorns, and, for all intents and purposes, they are in no way inferior.

The champion shorthorns of Smithfield for many years past have none of them been eligible to the Herd-Book, though all by pure-bred bulls; thus illustrating their efficiency in crossing purposes.

RESPONSES FROM VARIOUS QUARTERS.

A note from Sir John B. Lawes, Bart., from Rothamsted, Herts, refers to the district as one chiefly devoted to corn growing, and having no special breed of cattle or sheep. (Inclosure 9.)

I may here observe that in recent years Sir John has laid down many acres of his estate in grass, and that in the neighborhood a considerable herd of stock, cattle and sheep, of diverse breeds, is kept, maintaining the special characteristics of the districts from which they have been changed.

Somerset Derons.—Mr. T. H. Risdon, of Somerset (inclosure 10), forwards a valuable condensation of information as to Somerset Devon cattle:

At Washford the mean temperature is 50°. It is as high as 66° in the summer and the winter mean is not below 34°.

The girth of Mr. Risdon's Devon cows is 7 feet 6 inches; of bulls, 7 feet 6 to 8 inches, thus competing with Shorthorns, except that the latter have greater length.

The average yield of milk is 1,500 quarts including time of suckling. The breed is regarded as native to the soil and pure blood has been recorded for over one hundred years. By interchange of sires in-and-in breeding is avoided as much as possible. Store-stock are housed, January to April, inclusive. The cattle are fattened in watered meadows on grass grown after hay-making until the end of October, when they are housed in covered pens. The breed are bred and reared on much higher altitudes, with corresponding lower temperature, than at Mr. Risdon's homestead.

The average live weight is from 13 cwt. for cow to 17 cwt. for bull.

Shorthorn Gwynns.—The report from Bedford (inclosure 11) from Messrs. J. and F. Howard, quotes Shorthorns (Gwynn tribe) as mature at 3 years. Their live weight averages from 14 to 16 cwt. The live weight of fat stock is, for the cow, 18 cwt.; bull, 23 to 26 cwt.; ox, 16 to 18 cwt. From the milk, 16 quarts daily; the week's butter is 8 pounds.

Norfolk Red Polls.—From Stanton, near Harleston, Norfolk, I was favored with a report from Mr. Alfred Taylor (inclosure 12), whose herd of Red-Poll cattle is typical and of high excellence. The farm in South Norfolk is 114 feet above sea level, upon a clay and gravel subsoil, and the pasturage is of permanent grass, or of clover and rye grass sown with arable rotation. Accessible shelter is provided in winter adjoining the meadows on which the cows are pastured. Mr. Taylor considers he

can keep three Red-Polled cattle where only two Shorthorns would find sufficient food, and having kept both breeds at the same time and on the same farm he bases his opinion on experience.

The constitution of the Red Polls is very hardy. Fat steers from two and one-half to three years old weigh 60 stone, and upwards (840 pounds), when fed in the ordinary way on roots, hay, and cake. This is the dead weight of ordinary fat stock; and such as are "ripened" for the Christmas shows have weighed 1,764 pounds (see page 7 of inclosed pamphlet).

The meat of the Red-Polled cattle is excellent, and has a larger proportion of lean when compared with some other breeds.

Mr. Taylor, in referring to the several particulars given in the above pamphlet, accepts them as correct statements, and I may add that the writer is well recognized as a competent critic of the Red-Polled cattle, and is the editor of its Herd-Book.

The popularity of this breed has rapidly increased in its own district and abroad, so much so that breeders are restricting their sales in order to obtain sufficient numbers at home.

The Loft Suffolk Red Polls.—The herd of Red Polls belonging to Mr. Loft of Troston, near Bury St. Edmunds, Suffolk, is of great repute, and gave its owner the confidence to challenge the breeders of Scotch Black Polls to show a group of five animals in competition with five Red Polls. However, the comparison has not yet been publicly made, and the five "Doddies" shown by Mr. McCombie at Paris, in 1878, are still recognized as the best group ever exhibited. The farm of Mr. Loft is 40 to 70 feet above sea level, and the range of temperature in 1883 was 48.6 degrees, the rainfall 26.19 inches. The soil is a mixed drift, very unequally distributed on a chalky subsoil, or drift clay, sand, and gravel. Old meadows, varying greatly in different seasons from the natural pasturage, and artificial pasturage of clover, sainfoin, and rye grass is made, principally for horse and cattle keep. Mr. Loft has also used largely *gorse* for horses and cattle, and gives his stock in small quantities chicory, Jerusalem artichokes, prickly confrey, &c.

The cow stock are taken in at night as soon as white frosts begin to appear in autumn, and are tied up in a large and lofty barn, but during the day are turned out to graze, or for air and exercise only, in a large yard, according to circumstances. In summer, from May to October, they are fed on the pastures continuously, sometimes helped with cheap or abundant food like cabbage, turnips, swedes, or two to three pounds of cake. The winter feeding is swedes, turnips, cabbages, cake, barley, or other meal, malt grains, and hay or straw chaff. Mr. Loft is breeding three sorts of Red Polls; first, large growthy beef-makers; second, middle-sized general-purpose animals, milk and beef; third, a small size for milk only.

Heifers commence to breed from fourteen months, and line-breeding is approved by Mr. Loft, except when special objection exists. The difference in weights are as follows: Large size: Bull, 1 ton to 1 ton 7 cwt.; cow, 15 cwt. to 17 cwt.; steer, 12 cwt. to 13 cwt., 2 years old. Middle size: Bull, 18 cwt. to 1 ton; cow, 13 cwt. to 14 cwt.; steer, 10 cwt. to 12 cwt., 2 years old.

Mr. Loft looks to form a small dairy Red-Poll tribe of less size than either the Kerry or Breton stock, but has only bred with these animals a couple of years. The remarks of Mr. Loft on milking qualities in cows deserve attention.

The origin of the Red Polls is a debatable point, and therefore it is important that Mr. Loft distinctly states "the root of the race is the

old Suffolk cow." About the time of the first French revolution High Suffolk was noted for its herds of dun cows, pale yellow, or slightly ginger color. This cow, Mr. Loftt believes, is a variety of the old White-Polled cow indigenous to the country, and kept, in bygone times, either tame by the monks or semi-domesticated in noblemen's parks. He intends to get up two small herd of these old and very scarce stock, famous for their milking qualities.

The Herefords.—In reply to my inquiries, Mr. T. Duckham, M. P., who, as first editor of the Hereford Herd-Book and representative and resident in the county, is generally associated with its celebrated cattle, gives his authority to the belief that they are "indigenons" (inclosure 13). He also refers to the records of Smithfield for comparison of the Hereford breed with other sorts.

I may here note that whilst staying at King's Lynn, Norfolk, after my visit to the farms of the Prince of Wales, I found the picture of a Hereford ox on the walls of the hotel. This animal was exhibited in 1844, and was bred in Norfolk by Mr. Hudson, of Castle-Acre. The weight was 1,948 pounds, the carcass weighing 1,740 pounds, and the fat 208 pounds. The dead weight of the world-renowned Durham ox was 2,322 pounds.

The Morland Sussex.—Mr. W. C. Morland, of Lamberhurst Court Lodge, Kent, in reference to the Sussex breed of cattle (inclosure 14), gives their weight at three years—cow, 80 to 85 stone; bull, 100 to 190 stone, the stone being 14 pounds. In this, as in other cases, the recorded weights at Smithfield furnish the best comparison between the various breeds.

The Sussex stock are notably a heavy, beef-making breed. It is a point to be remembered that the cattle are housed in winter, not on account of delicacy of constitution, but because of the wetness and coldness of Wealden soil, a geological special clay.

The Sussex breed are believed by many stock exhibitors to have been derived from the Devon breed, but for a long date they have been native to Sussex, where they are favorites.

The opinion of Mr. John Treadwell, Upper Winchenden, Aylesbury, Bucks, is regarded as second to none in the matter of stock. Mr. Treadwell's leisure is entirely taken up by judging at the Royal Society and other shows. This farm of 270 arable and 330 of pasture acres is visited by agriculturists from all parts. In his report (inclosure 15) he states that his herd of Shorthorn grade milk cows average 16 pints of milk each per day.

The North Devons.—An unsigned return (inclosure 16) from North Devon speaks in favor of the North Devon breed of cattle for local breeding and feeding, and gives a very moderate estimate of weight at maturity—cow, 6 to 8 cwt.; bull, 10 to 12 cwt.; ox, 8 to 10 cwt.—which seems to fit with the appellation given to North Devons, "the little noblemen of the hills."

The inclosure herewith sent (No. 17), relating to Smithfield, gives the names of prize breeders for several years, and these names form a directory of great value to buyers.

THE ABBEY FARMS HERD OF SHORTHORNS.

Among the noted herds I was fortunate in being able to pay a visit to the stock farms of Mr. Hugh Aylmer, West Dereham. I arrived at the well-known "Abbey Farm" unexpectedly, and found Mr. Aylmer was "amongst his stock in the fields." I soon had the pleasure of

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making the acquaintance of one of the most successful breeders of Short-horns now living, and whose name with that of Mr. Booth is connected wherever the celebrated blood is found. The inclosure (No. 18) is the current catalogue of Mr. Aylmer's stock, to which reference will show the unrivaled character of the stock.

The homestead, near the remains of the old abbey, is situated in a rich, level country, some of the pastures carrying one and a half bullock to the acre.

On two out of the three farms occupied by Mr. Aylmer there had been a slight attack of foot-and-mouth disease (a terrible scourge, where animals worth 500 guineas each are exposed), which had been successfully treated and routed.

At Dereham we were on classic rural ground, for Tusser, the agricult-ural-axiom author, occupied the moated farm where the abbey remains.

Having visited the plain, useful farm buildings, all fairly ventilated, and seen the first group of a dozen pedigree cows all out for day graz- ing, during the present very open season, we went to the manor-house farm, passing the flock of Cotswold shearing ewes, fenced in with inex- pensive string netting tied to sticks. In the cattle stables each manger had three divisions, one for sliced roots, one for broken cake, and one for a lump of rock-salt. The latter was everywhere, in buildings and fields, always accessible.

On this farm, amongst the stock that I especially noted were young Sir Anthony, a red-and-white bull, calved last March; Stopford, just twelve months old, son of the Sir Simeon which has just been sold at a large price to go to Ireland. Stopford promises to become as grand as his sire. There were also a couple of heifers—Castanet 10 and Cas- tanet 11—bred from that capital bull Sir Benedict, 12388, a splendid white roan. These two Castanets, half sisters and about a year old, are considered worth 1,000 guineas the pair.

The bull Felix, rather over two years, was a very handsome and com- plete roan, and goes back to Comet, an illustrious descent. King Rod- erick and, indeed, most of Mr. Aylmer's stock, have no iceably flat oval- shaped horns. Some of the grand old cows we were looking at had produced ten to a dozen calves, selling at from 350 to 400 guineas each. One young bull-calf we saw, under twelve months old, is priced at 350 guineas.

The repute of Mr. Aylmer's stock is such that for twenty-five years there has been no occasion to exhibit at shows. Some of the cows, I noted, had twice calved in the twelve months—a good evidence of their prolific nature.

In Mr. Aylmer's "workshop," or study, was the framed certificate awarded him at the Centennial Exhibition held at Philadelphia in 1876, where he exhibited a pen of his sheep.

DENCHFIELD STOCK.

From the celebrated vale of Aylesbury Mr. Edw. Denchfield gives some useful details of Buckinghamshire as to its famous regions (in- closure 19).

Plaster clay is the geological strata southeast, between the Thames and river Colne. Then there is the chalk formation of the Chiltern Hills, and the Tesworth clay fills up the vale of Aylesbury, noted for its pro- ductions both animal and vegetable. Limestone and oolite occupy the north of the county, and the natural grasses of Buckinghamshire favor the finishing off as well as the rearing of stock. Dairy herds of Short-

horns flourish here, whilst the summer meadows are good enough to graze and fatten bullocks.

Yards and stalls are afforded to house the cattle in winter, but some of the stock remain out all the year round. The stock thrive on the grasses in summer and get hay, straw, roots, and artificial food in winter when needed. The cattle are bred in the dairy herds and weaned at first on milk or artificial substitutes. The heifer calves are brought on to replenish the herds, and the young bull calves are either sold as stock bulls, or as oxen are drafted into other counties of tillage land, to be fed out.

Mr. Denchfield adds that he finds Shorthorn cattle best for dairying purposes, since they come to heavy weight for the butchers when fed out. The yield of milk and butter varies much with the seasons, so that the last decade of wet years has lowered the average before established.

I may here observe that some of the very best stock of all kinds, horses, cattle, sheep, and pigs, come out of the county of Bucks, and with such good stock the name of Denchfield has been associated for many years.

COTSWOLD CATTLE.

From Colonel Nigel Kingcote, M. P., I may conclude the special references. In the Shorthorn Herd-Book Colonel Kingcote, at the present time as in the past, will be seen to own some highly celebrated stock. His estate, Wotton-under-Edge, Gloucestershire, is 800 feet above sea-level, on the west of the Cotswold hills. The geological stratum is oolite, and here, on a brush loamy surface soil, the pure-bred Shorthorn cattle, the pure-bred Sussex Southdown sheep, the pure-bred Suffolk cart-horses, and the pure-bred Berkshire pigs form a higher class stock than I note in evidence of the adaptability of diverse English breeds to a "habitat," thus is, in each instance, a change to their original districts, but where they all flourish and attain a high degree of excellence.

The cattle are housed in winter, in covered yards and open sheds, and fed on hay, straw, and roots. They reach the weight of 18 cwt. and upwards, and are disposed of by private and public sale.

WEIGHTS OF THE VARIOUS BREEDS.

The comparison of cattle breeds, in the report made by Mr. Faulkner, whose figures are valuable, brings together the following points, as averages in pounds (embraced in Consul Dockery's report):

Live weights, under four years old.

Breed.	Steer.	Heifer.	Cow.
Welsh	2,498	2,214	2,031
Herefords	2,486	2,127	1,850
Polled Aberdeen	2,375	1,883	1,850
Sussex	2,241	1,890	1,850
Shorthorn	2,212	2,019	1,850
Highlander	2,002	1,446	1,411
Norfolk Polled	2,012	1,984	1,850
Devons	1,966	1,600	1,600
Jersey	850		

Dead weight, average in pounds.

Shorthorn	920	800
Sussex	840	720
Longhorn	800	620
Polled Aberdeen	700	
Polled Norfolk	600	
Ayrshire		

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Offal reckoned 8 pounds to the score, except in regard to Welsh, of which the offal is estimated 9 pounds to the score.

Amongst records of extraordinary weight are three instances, these being of a Durham ox, a Hereford animal, and a Norman, the latter being exhibited as the "beef gras" in Paris.

The dead weight of the Durham ox that was exhibited throughout England, in a former generation, was 2,322 pounds; of the Hereford ox, 1884, bred in Norfolk, 1,938 pounds; and the Norman bullock, alive, weighed over 30 cwt.

MILK AND BUTTER YIELD OF THE VARIOUS BREEDS.

The average weight of milk thus compares yearly:

Breed.	Pounds.	Pounds of milk to 1 pound of butter.	Pounds of milk to 1 pound of cheese.
Shorthorns	8,000	24	10
Herefords	3,000	24	10
Devons	3,500	24	9
Polled Aberdeens	3,500	24	10
Galloway	3,000	24	9
Polled N. (see printed notes forwarded)	3,000	24	9
Highlander	2,750	24	9
Sussex	4,000	24	11
Welsh	3,000	24	10
Longhorns	3,000	24	9
Ayrshire	6,000	24	9
Jerseys	4,880	17 to 20	9

In a recent instance the Devon cow Myrtle gave 26 pounds of milk in a day at the London Dairy Show, and the solids of her milk were found superior to that from the Jersey competitors. The Polled Norfolk cows have also given some large milk records, and extending over a long period.

Mr. Faulkner's opinion is in agreement with that of most other experts when he indicates the best beef-producing animal as the cross bred from the Scotch Polled cow and Shorthorn bull. Still, of late, this superiority has been challenged by breeders of Hereford and other crosses.

PRICES OF THE VARIOUS BREEDS.

The general prices of pedigree animals are closely appraised for cows and heifers:

Breed.	Price	Breed.	Price
Shorthorn	£35 to £50	Hereford	£35 to £50
Devon	30 45	Galloway	25 40
Ayrshire	30 45	Ayrshire	30 40
Welsh	30 40	Norfolk	30 40
Jersey	20 30	Welsh	20 30

The prices at which stock was sold during the year 1883 at the Birmingham Show sale were as follows:

Shorthorns.—One bull 200 guineas and one for 50 guineas; one heifer brought 37 guineas, and one of "Factory Girl strain" 82 guineas. The prices of others sold ranged between the last two prices named.

Sir Hugh Aylmer's sales of Shorthorns took place at the Manor House, West Durham, on the 3d of May. It was well attended, but prices were not so high as many anticipated. Fifty-five cows brought £3,798 18s. 6d., averaging £69 1s. 5d. each. Eighteen bulls sold for £1,038 6s., or an average of £57 13s. 8d. The highest price paid was for Eastthorp Lady 2d, calved May 11, 1881, 200 guineas. The celebrated bull Sir Simeon was passed, the reserve of 500 guineas not having been bid.

On July 11, at T. Halford's sale of Shorthorns at Castle Hill, Sherbone, four cows and three bulls brought on an average £745 10s. each. The highest figure, paid by Lord Bective for the Duchess of Leicester, was 1,505 guineas. Thirty-two cows averaged £185 7d. each, and six bulls averaged £281 18s. 6d. each.

At Henry Lovatt's sale, July 3, at Low Hill, Wolverhampton, the average obtained was £53 2s. 2d.

The great Halker sale of Shorthorns took place on September 6, and showed a large falling off from previous years. Thirty-one cows and heifers averaged £182 each; the bulls averaged £112 each. Twelve Oxford cows and heifers averaged £312 17s. 6d. each, and seven bulls of the same family £142 1s. each.

Hereford prices.—At Mr. F. Platt's sales at Barnby Manor, Newark, July 21, one bull calf, four months old, sold to Mr. C. M. Culbertson, of the United States, for 100 guineas. Another sold for 150 guineas. One cow and calf sold to Mr. Barleigh, of the United States, for 175 guineas; also a heifer to the same purchaser for 90 guineas. One bull, Grove III, was sold to Mr. Culbertson for 810 guineas. The average price of cows and cattle was £68 17s. each, while that of bulls was £107 each. At the sales of Mr. George Pitt, on his farm of Chadnôr Court, twenty-one head were sold at an average price of £77 1s. 9d. each. The highest price paid was for the cow Rosebloom, which was purchased by the Hon. M. H. Cochrane, of Canada, for 260 guineas. He also took her heifer calf at 47 guineas.

Sussex prices.—At Mr. Thomas Knight's sale in October last the prices obtained were, perhaps, the highest on record for the breed; twelve cows brought on an average £42 6s. each; four two-year old heifers £49 4s. 6d. each; six yearling steers £23 10s. each; six weanyer heifers £29 4s. 6d. each; and five weanyer steers £17 12s. 6d. each.

Jersey prices.—For Jersey cattle some very high prices have been paid. One bull calf, six weeks old, sold for £2,500. The average prices of those shipped to the United States during the year (over 800 in number) will exceed £45 each.

Prices of Aberdeen bulls.—At R. C. Auld's sale, on the 13th of December last, twelve cows averaged £114 9s. 6d. each; eleven two-year old heifers £156 3s. 9d. each; seven heifer calves £90 7s. each, and two five-year-old bulls £53 11s. each.

The general average for fifty-one animals was £90 16s.

Prices of West Highlanders.—The Earl of Dunmore sold drafts from his superior herd of West Highlanders, in the island of Harris, at Inverness, nine bulls (six being calves) at an average of £21 each; also eighty-four cows and heifers at an average of £19 9s. each. The highest prices paid were 50 guineas for a three-year-old heifer, and two heifers at the same age sold at 48 guineas each.

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COST OF TRANSPORTATION TO THE UNITED STATES.

I note the cost of transit and attendance of stock as estimated from the consular reports of Dundee and Liverpool, and confirm them as approximations that may be taken as a guide to fluctuating circumstances.

Upon inquiry I learn that the ordinary charges for the transportation of cattle from London to New York are as follows: Bulls and cows alike £5 to £8, according to demand; calves under 12 months, Above 12 months the charges are the same as for bulls and cows.

Under the British passenger act steamships cannot carry more than ten head of cattle if more than fifty stowage passengers are on board.

CATTLE CENSUS OF THE UNITED KINGDOM.

The proportions of the different breeds of cattle, and between the numbers of stock that are being reared and fattened for meat and for the production of milk, are partly given in the official reports, but any estimate thereon must be accepted only with great reserve.

The total number of cattle in Great Britain and Ireland in 1882 was 5,962,771.

EXPORTS OF BRITISH CATTLE.

The export of cattle from Great Britain and Ireland to other countries is confined to selections of breeding animals, which, relatively small in numbers, is yet so important from the wide area of demand, that many English and Scotch breeders are restricting their offers of stock, feeling the necessity of reserving their animals for home use. This is especially the case in respect to Scotch Polled, Norfolk and Suffolk Polled, and the Hereford breeds.

The proportion of pedigree stock kept by farmers is still very small compared with the general purpose stock, often pure bred but unregistered, and the various cross-breeds that are commonly preferred both for meat production and milk.

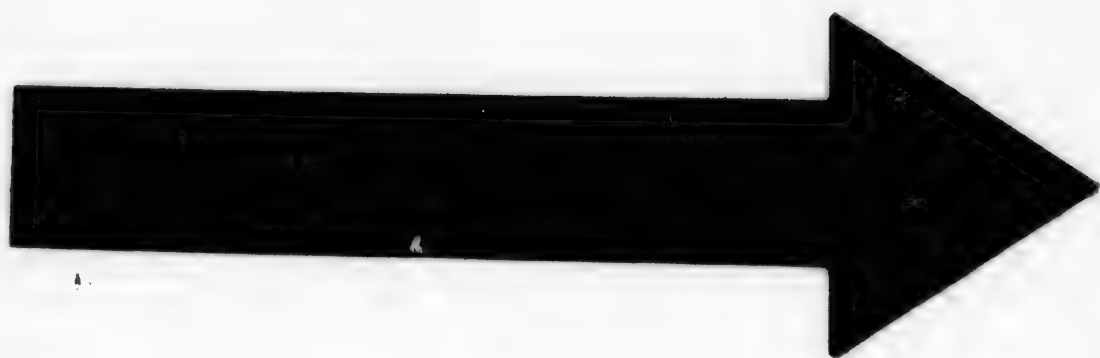
In the table of weights (inclosure 17) it will be seen that the cross-breeds head the list for their daily increase.

ACKNOWLEDGMENTS.

In these concluding remarks, I refer with pleasure to the assistance I have received from Mr. Kains-Jackson in making my inquiries, and I desire to put on record my sincere acknowledgements to my several correspondents for their frank and courteous kindness in giving me full information which, from their great resources and experience, was especially valuable.

E. A. MERRITT,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
London, January 31, 1884.



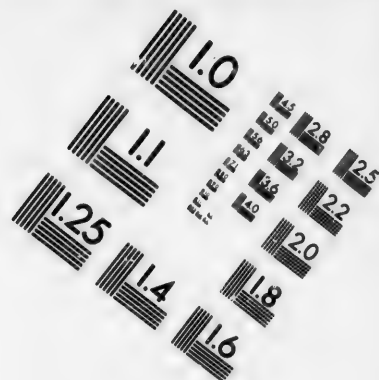
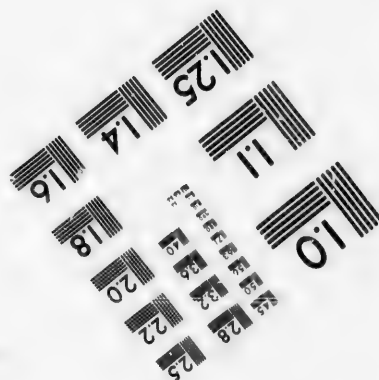
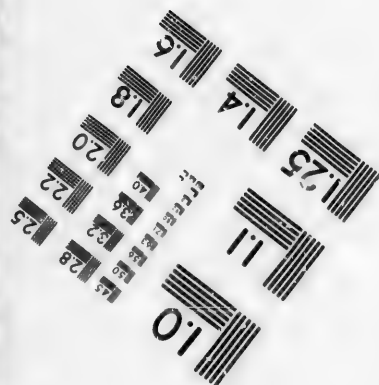
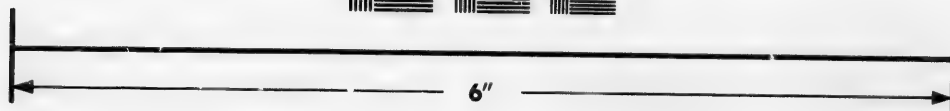
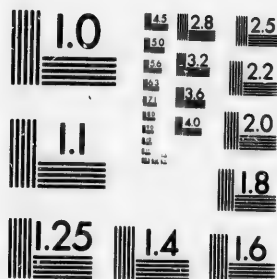


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Inclousures in Consul-General Merritt's report.

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|--|--------------------------------------|
| 1. Notes on French Stock. | 12. Return from Alfred Taylor. |
| 2. Report of last French Show, by K. Jackson. | 13. Return from T. Duckham. |
| 3. Holt Beeber on Shorthorns. | 14. Return from W. C. Morland. |
| 4. The Cattle of Great Britain. (Illustrated.) | 15. Return from J. Treadwell. |
| 5. History of Argus Cattle. | 16. Return from North Devon |
| 6. Farmer's Hand-Book. | 17. Giving names of prize breeders. |
| 7. Return from Samuel Beck. | 18. Catalogue of Mr. Aylmer's stock. |
| 8. Return from Mr. R. Stratton. | 19. Notes from Buckinghamshire. |
| 9. Return from J. B. Lawes. | 20. Return from Colonel Kingscote. |
| 10. Return from T. H. Risdon. | 21. Table of milk record. |
| 11. Return from J. and F. Howard. | 22. Report on dairy trials. |
| | 23. Table of weights. |
| | 24. Number of selected portraits. |

[Such portions of the above-mentioned inclosures as are not incorporated in the consul-general's report, and are otherwise of practical value to American agriculturists, will be found in the supplement.]

CATTLE BREEDS OF THE UNITED KINGDOM.*

The great importance of the information called for to a vast number of people and of interests in the United States led me to seek out an authority of undoubted experience and ability in England, to furnish the desired data in behalf of American agriculturists and others. I adopted this plan for the reason that, in order to make it specially useful, the report should be full and reliable in every respect.

As a matter of course I could not be able to equal an adept in this particular line of investigation, for the reason that the subject is one covering such a wide field and one beset with so many difficulties that only one having an extensive acquaintance with English breeders and breeds of cattle could do the subject justice.

I was most fortunate in securing the services of Mr. James Long, of Hetchin, England, a well-known authority on agricultural subjects both in England and on the continent, who has prepared the accompanying clear, strong, and exhaustive report.

It will be found that great care and attention have been given to this report, and that its impartiality and fairness are beyond question. Where so many interested dealers in and breeders of cattle have to be consulted, it is important that the facts about such breeds should be stated by one who is perfectly free from bias in any respect. This has been done in this report, and I submit the same with full confidence that Mr. Long's acquaintance with our agricultural interests, through this valuable mass of information, will lead to a desire on the part of our agriculturists to follow up the results of his future investigations as they may hereafter be given to the public.

ALBERT D. SHAW,
Consul.

UNITED STATES CONSULATE,
Manchester, February 19, 1884.

* This report was prepared for Consul Shaw, of Manchester, by Mr. James Long, of Hetchin, England.

A.—INTRODUCTORY—BRITISH CATTLE AND CATTLE IMPORTS.

The annexed particulars, referring to the only pure races of cattle known in the United Kingdom which are essentially British, will be found in almost every case very complete and answer every question put in the circular. The exceptions are the Shetland, the Galloway, and the Sussex, about which it is most difficult to obtain technical information. Some twenty Sussex breeders have been addressed, but their answers are not entirely satisfactory, but the information given will be found reliable in every way. The Shetland is an almost entirely unknown race, and the Galloway, to which I desired to give a fuller place, I hope to supplement; the editor of the Herd-Book, who is collecting information, promising to send it to me shortly. In all, the fifteen British breeds are treated, and the information given is based upon that furnished by nearly a hundred of the leading breeders in the country, and which has been arranged by the writer, who has added much which an extended experience has enabled him to rely upon. It will be noticed that almost every breeder speaks of his own race as the best; this is natural enthusiasm, and I have in some cases been compelled to slightly tone the rather exaggerated praise bestowed upon one breed in opposition to another. Particulars are added with reference to breeding, feeding, soiling, shipment, and scientific dairy instruments, and centrifugal cream separators,* which will be found very complete, the two last named subjects being especially familiar to the writer, who has investigated them in each European dairy country. Drawings or wood cuts are annexed as well of these machines and instruments as of the chief races of cattle.

Foreign cattle are little kept in England, and almost all the small herds which had been formed have been dispersed or have degenerated on account of the Government action entirely preventing importation. Dutch cows were at one time very largely used for milk production while French, Spanish, and German beasts were imported in immense numbers for beef. Now the only countries sending live animals in any numbers are Denmark and Sweden and Norway; the first named doing an immense trade last year, leading the United States during the first five months, since when she has started a large company and is building a new fleet of ships for further extending the trade. The Danish cattle come from Aalborg, in Jutland (which port I visited last year), to Newcastle and Hull, and are chiefly Jydsk or Jutland, a medium-sized race of moderate quality. A few Swiss cattle are kept in England, the writer having a few years ago formed the largest herd; the beasts are large, silver-grey in color, slightly too heavy in bone and skin, but very large milkers, good feeders for the butcher, and extremely hardy, living where the majority of other beasts would starve. These beasts are extremely profitable and the handsomest of any known race in color. French cattle are not bred in England, but the Shorthorn is largely bred in France for crossing upon the Charolaise, Cotentin, and Nivernais beast, which it much improves, the Government keeping up one pure Shorthorn breeding establishment for the purpose. In my numerous visits among the French breeders I have found their opinion of the Shorthorn to be that it is better than any race they have, and considered to be the best in the world for crossing. This, however, is not bred to such perfection as in England.

* These special papers will be found in the supplement.

Best importing cattle.—The best beasts to import are:

For meat.—The Shorthorn, the Hereford, the Aberdeen Poll, the Galloway, the Devon, the Sussex, and the Longhorn.

For beef and milk combined.—The Shorthorn, the Red Poll, and the Devon.

For milk alone.—The Ayrshire, the Shorthorn (not pedigree), the Red Poll, and the Kerry.

For butter.—The Jersey, the Guernsey, and the Red Poll.

For bleak, cold, or wet districts:

For beef.—The West Highland and the Welsh.

For milk.—The Kerry.

For beef and draught.—The Sussex, the Devon, the Welsh, the Highland, and the Longhorn.

Cost of British cattle.—The cost of animals of these races depends solely upon whether pedigree is desired or merely good, useful specimens such as the best farmers select for their own use. The following figures, however, may be entirely relied upon for useful non-pedigree beasts well selected:

Breeds.	Bull, 1 to 3 years.	Cow.	Heifer.
Shorthorn.....	£20 to £50	£30 to £35	£22 to £30
Hereford.....	20 50	30 35	22 30
Devon.....	20 50	30 35	23 30
Longhorn.....	20 50	30 35	25 35
Sussex.....	20 50	30 40	25 35
Red Poll.....	20 50	30 40	25 35
Aberdeen.....	20 50	30 40	25 35
Galloway.....	20 50	30 40	25 35
West Highland.....	20 50	30 40	25 35
Welsh.....	20 35	15 25	12 20
Kerry.....	25 40	20 35	17 30
Shetland.....	35 60	30 40	23 30
Ayrshire.....	15 40	25 35	20 30
Jersey.....	15 40	25 35	20 30
Guernsey.....			

For pedigree beasts fancy prices are paid, often most unwisely, for unless a particular animal is wanted the best of blood can be obtained if the purchaser can meet with any person to guide him, and who will take the trouble to go with him, at considerably less money than is paid by Americans in the ordinary way. I frequently see buyers (English) who purchase for fashion, giving high figures for animals, while better animals in the same herd are overlooked, although they could be bought at market price.

Number of cattle in the United Kingdom.—The cattle in the United Kingdom are as follows: In England, 4,250,000; in Wales, 651,000; in Scotland, 1,095,000; in Ireland, 4,096,000; total, 10,097,000. Of these there are cows in milk or in calf: In England, 1,650,000; in Wales, 200,000; in Scotland, 395,000; in Ireland, 1,101,000; total, 3,724,000—a decided increase, but considerably less than ten years ago.

Imports of cattle and cattle products into the United Kingdom.—The imports have considerably decreased, owing chiefly to the cattle-disease restrictions, and the same cause has prevented animals being more largely bred. The imports were: In 1865, 283,000; in 1871, 248,600; in 1876, 271,000; rising in 1880 to 389,000, and falling in 1882 to 343,000.

In the year 1882, 314,000 cattle were brought into the metropolitan cattle markets, of which 50,129 were foreign. The average price of beasts in 1882 was, for inferior, 4s. 3½d. per stone; second class, 4s. 9½d.; third class (large, prime), 5s. 7½d.; fourth class (Scots), 5s. 10½d.

In 1882, 228,429 cwt. of salt and 463,952 cwt. of fresh or slightly salted beef, 201,000 cwt. unenumerated, 560,000 preserved, &c., other than salted and tongues were imported, against 251,000 cwt. of salt, 817,000 cwt. of fresh or slightly salted, 178,000 and 575,000 cwt. of unenumerated in 1881; or, in other words, beef to the value of nearly a million sterling less.

The average weight of cattle received from other countries is: Denmark, 70; France, 103½; Schleswig-Holstein, 85; Netherlands, 85; Norway and Sweden, 78; Portugal, 86½; Spain, 71; Canada, 90; the United States, 101.

England cannot breed sufficient cattle either for beef or the dairy to meet her requirements, and there is a great market for dairy cows at all times.

In the face of existing regulations the best means of sending beef to England is by means of refrigerators, and, where the price will pay the exporter, he may reckon upon a continuous demand. Dairy produce is always in demand, the home supply being far too little, and Denmark, France, Holland, and Germany supplying great quantities. If a fresh-butter trade or a cream (preserved in tins) trade could be established it would succeed. The home-cheese trade is succeeding better, while cheese and salt butter are produced from countries much nearer and at such prices as America could hardly hope to beat.

British cattle are in general so used to a severe, changeable, and moist climate that they are certain to do well in all but very hot countries where herbage is tolerably good.

I have to acknowledge valuable aid from the editors of the *Herd-Books of the Red Poll and Welsh*; Mr. Barthmore, of Ayrshire fame; Mr. James Guernsey, Mr. Brydon, and the editors of two of our principal journals, and other gentlemen, many of whom are named.

B.—BREEDING CATTLE.

Mr. Burrows says that one of the most important considerations for the breeder must be the adaptability of his stock to the situation and climate, the soil he cultivates, and the crops he can grow. To expose too suddenly some breeds of cattle to the climate of a bleak, hilly country would be to greatly endanger their safety. An Alderney, a Short-horn, a Hereford, or even a Sussex or a Devon beast might not maintain its condition where a Polled Angus, a Welsh Runt, or a Scotch Kylee would gain flesh. In such places, and upon a poor, thin pasture, no race of cattle imported from good herbage and a warm and well-sheltered district can be expected to pay the way without considerable outlay in artificial food. An improved breed will, to some extent, have lost those characteristics which at one time adapted the animals to a rougher life, the thick pelt or hide, the coarse hair, and abundance of bone and muscle.

In selecting an animal for breeding or fattening, it is advisable to look for a moderately small head and a placid countenance; a fine muzzle, with good open nostrils; length in the neck and depth in the shoulders; a broad and straight back and a good round barrel; width across the loins and between the fore legs; large girth behind the shoulders, and full and heavy flanks. With such points we may expect to rear and fatten stock capable of laying the greatest amount of meat upon the prime parts. The hide of such an animal should be mellow

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and covered with soft and glossy hair, and the bone should not be coarse.

The form of a beast is a matter of primary importance. In the Short-horn, the Hereford, and the improved Angus, we have this in perfection. The wide and level hips are accompanied by a massive loin and deep, long, and square quarters. The springing ribs give to the body nearly a vertical section. In a perfect beast the breast should stand prominently out between the fore legs, coming down almost upon a level with the knee-joint. Given a wide back and a good wide breast, and most other good points are insured. When well fed the flank of such a beast in handling appears to drop into the fingers. It will prove to be a grazier's without, a butcher's within.

In the matter of breeding for economical meat production, the cardinal point to be kept in view is early maturity. Under present circumstances of farming, with higher rents than of yore, heavier expenditure on labor, increased taxation, and a score of other ills to which farming is heir, early maturity in the animal and the production of the largest amount of meat with the smallest amount of offal should be the aim of the breeder and the grazier. Close observation will generally convince us that most of our races of cattle and classes of sheep have some peculiar properties which especially adapt them to the districts in which they have been bred and grazed for generations. This fact should not be lost sight of. But in selecting the improved breed of each kind we obtain the best meat-producers. This remark applies to cattle, to sheep, and to pigs alike. In such the active or even restless habits of the original breeds have, by selection, regular attention, and good feeding, yielded to docility, or in some instances even to a certain sluggishness highly favorable to fattening. Easy access to food has reduced the proportions of bone and muscle, so that a pure-bred and a high-bred beast is often the best manufacturer of meat from any given amount of fodder, roots, corn, and cake. The advantages of a pure breed or a first-cross are numerous. There are few greater disappointments than for a favorite cow to breed back.

Age for breeding.—Upon the most contested point of the earliest age for breeding we have valuable opinions from many well-known authorities. Mr. Thomas Duckham, M. P., himself an eminent breeder and exporter of Herefords, in a lecture given before the Breconshire Chamber, quoted the opinion of Dr. Hitchman, chairman of the Derbyshire Agricultural Society, to the following effect: That the desire for present advantage in breeding leads to great evils in the future. By placing animals too young into breeding condition you tax nature too heavily, and two evils ensue—the parent is stunted, and the progeny is smaller than it otherwise would be. When nature is busily employed adding to the growth—*i. e.*, to the size and completion of every muscle, bone, and viscera of the animal—every particle that goes to the building up of the animal system being derived from the blood of that animal, the blood being supplied with those materials exclusively from the food which is taken into the stomach and digested, every organ of the body (the stomach, the liver, lungs, heart, &c.), being taxed to the utmost to fabricate the necessary materials for the growing muscles, ligaments, and bones of the young animal, by causing this creation to be impregnated at such an early period in its growth you call a new set of organs and functions into activity; and, further, you call another creature into existence, having like structures to be built up. But while you do this you cannot add to the digestive or the assimilative

powers of the animal; you have no more material with which to supply the two bodies than you had for the one.

Individual cases of success from early breeding may be quoted, but the general results, as ascertained over wide areas, are against it. The certain results of breeding from heifers at too early an age will be a race of cattle diminished in size and weakened in constitution. From 2½ years to 3 years old is quite early enough for a heifer to calve if she is to be the mother of a long line of noble animals. And no bull can be freely used without injury until he approaches two years old. In any system of breeding the time for dropping calves must, to a great extent, be regulated by the accommodation afforded, and by the length of time which the animals are to be kept upon the land before feeding out or breeding. For economical meat production I know no time preferable to the very early spring. Cows, when not required for the dairy and in-calf heifers, can be cheaply kept in the straw-yard during the winter if they are to calve down in the spring; and thus more bullocks can be fattened out upon the fodder and the root crops. But if the breeding animals are turned upon really good pasture during the summer when they are in calf, they frequently lay on fat and produce puny calves. Where the progeny is to go out as a fat steer under three years old, this time of calving is well adapted, as it gives the animals three summers at grass and only two winters in the yard.

Before calving, exercise in good open yards is far preferable to tying up in stalls. Too high a condition at the time of calving is apt to produce inflammation, resulting in milk fever and speedy death. When the eye at such a period has a glassy appearance some aperient medicine should be instantly given. About half a pound of Epsom salts, with some powdered ginger and a little sulphur and niter, will answer the purpose if given in time.

C.—STOCK-FEEDING.

Food of young stock.—Food of young stock must be essentially bone and muscle forming, and it is well known that the continuous grazing of pastures by young stock and by dairy cows very rapidly exhausts the bone-earths, so that the land deteriorates and becomes year by year less adapted to rearing or dairying. Consequently, the ultimate success of either system pursued for any length of time upon the same land must depend very much upon the feeding of artificial food or upon top-dressing. A cow in full milk and yielding 750 gallons a year gives up in that milk the earthy ingredients of 33 pounds of dry bones. If this milk be sold off the farm or be made up into butter and cheese for market, of course the whole of it is lost to the land; and as this loss is equal to 30 pounds of common bone-dust, and every calf reared may be considered to carry away another 10 pounds per annum, the condition of such pastures can be kept up only by supplying in some form to the land the ingredients of 50 pounds of bone-dust every year. It is well known that in the animal rapid growth and quick fattening are opposite qualities; so, to encourage both, the muscle and bone forming constituents and the fat-forming elements must be given at the same time. In a general way, with liberal feeding, the animal makes more progress up to two years old than ever afterwards. With an animal in its natural state, the waste of the body is just counterbalanced by the food consumed. All excess of food beyond waste goes to form bone and muscle in the growing animal and fat in the mature one.

The object of the meat producer should be, by a liberal supply of food beyond natural requirements, not only to maintain this equilibrium, but also to create an artificial condition favorable to the production of fat. When the ox is thoroughly fattened every cell throughout its cellular tissue is well filled. In the beef the fat will be firm and solid and of a rich creamy color. The fat in mutton is whiter and greater in proportion to the carcass. In pork the proportion is still greater. The more we restrain the movements of the body the greater is the aptitude for fattening. Contentment aids the formation of fat. Violent exercise, by stimulating the lungs, consumes the fatty matters. The size of the lung has a marked influence upon fattening. A large lung, developed by abundant exercise, burns away the heat-producing matter and retards fattening. On the other hand, a small lung and a small liver, though they render the possessor much more delicate, are favorable to fattening. In animals nature provides in a time of plenty for some of their requirements in a time of scarcity. Starch and sugar maintain heat and vitality, but unless there is a supply of the fats and oils the progress will be slow, because the maintenance of the vital principles taxes the latter. All vegetable foods vary with the age of the plants yielding them and the soil they grow upon. Hence the care necessary in selecting seeds for laying down pastures and in cutting and harvesting hay and straw. When grass is comparatively young it abounds in flesh-forming substances and in sugar. As the plant ripens the sugar becomes changed into starch and the starch into wood fiber. This shows the desirability of cutting all grass crops for hay before they are fully ripened. Cattle fed upon over-ripened hay have to consume some 13 or 14 per cent. more of indigestible woody fiber.

Value of various feeds.—Some experiments in feeding with hay alone have shown that in a large ox the store condition may be maintained by giving it about one-fiftieth of its own weight per day, or, if working, one-fortieth. A fattening ox, having nothing else, will consume from one-twentieth to one-twenty-fifth of its live weight, according to the degree of fatness it has attained. Sheep are said to consume about one-thirtieth part of their live weight of hay per day. These figures will show us that when hay commands a good price in the market it is not advisable to use it in any large quantity alone as a meat producer. With hay slightly moldy or much weathered, the process of steaming chaff, with an admixture of some maize meal, finely ground linseed-cake, or even bran, renders it more palatable and much more nutritious, as it greatly increases its digestibility. New hay is unwholesome and innutritious as compared with good old hay. After-math hay is better adapted for cattle than for horses. Straw is, perhaps, less in favor than formerly as a cattle food.

Ungenial seasons, wet harvest, and blight and mildew in the crops have lessened our dependence upon it, and the high price it has of late years realized in the market has placed it more on a par with hay for feeding out. But the practice of cutting down large quantities of it as it comes fresh from the threshing-machine in the summer time, mixing with a ton of the cut straw about a hundred weight of green-cut fodder and a bushel of salt, is kept up in many places; and when the admixture is properly made so as to produce a slight fermentation, it makes a very economical winter feed. The fermentation in straw increases its albumen about one per cent. and its feeding value as much as 25 per cent. Green oat straw and pea straw fed out together are but little inferior to hay. The oat straw of Scotland, where the crop is cut much greener than ours, far surpasses that of this country in feeding proper-

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ties. Oat straw and turnips in Aberdeenshire, without hay, corn, or cake, fatten many a good ox for the London market. With good oat straw *ad libitum* and an allowance of 10 stone of white turnips, or $7\frac{1}{2}$ stone of swedes, a well-bred steer will fatten rapidly. Or, if 7 or 8 pounds of mixed bean meal and linseed cake be given, one-half of the roots may be withdrawn. A ton of such straw cut up and slightly fermented, with an addition of 200 pounds of good linseed cake, is equal in feeding properties to a ton of the best hay. There are great advantages to be derived from a proper admixture of foods as well as from judicious and progressive changes. But all changes should be both gradual and progressive if we are to receive the maximum of benefit from them.

Carefully conducted experiments have demonstrated that under ordinarily favorable circumstances the consumption by a steer or bullock of either 8 pounds of bean meal or of 6 pounds of linseed cake will produce one pound increase in the live weight of the animal, but if these foods are used in combination, *i. e.*, if 8 pounds of the one be fed out with 6 pounds of the other, the increase in the live weight of the animal will be not 2 pounds, as we might expect, but 4 pounds; a conclusive proof that judicious admixture is the economical system. In the present instance the linseed cake is eminently a fat-producing food, and the bean meal a flesh-forming one. A chemical analysis of foods compared with the actual results obtained from practice, proves that we may obtain a pound of flesh from every given number of pounds of dry nutritive matter which those foods contain. With the ox it takes 12 or 13 pounds of nutrition to yield a pound of flesh; with the sheep, 9 to 10 pounds; and with the pig, from 4 to 6 pounds. Thus 100 pounds of swedes contain 90 pounds of water, and are, consequently, when fed off, equal to the production of about a pound of flesh. One hundred pounds of Indian corn or maize, containing only 13 pounds of watery substances, will produce about 9 pounds of flesh. Again, it has been ascertained by careful experiments that equal mixtures of maize, peas, and oats, though 7 per cent. lower in nutritive qualities than corn alone, may be fed out, weight for weight, with like results.

D.—STOCK—WEIGHT AND MEAT YIELD.

Measure, weight, and yield of meat.—An accepted theory is that 14 pounds of live weight in sheep will yield 9 pounds of meat and 5 pounds of offal, and 14 pounds of the live weight of a beast 8 pounds of meat and 6 pounds of offal. But the proportion between the live weight in the animal and the offal it will produce will depend very much upon the size of the animal and the degree of fattening. Other things being equal, it will give the highest percentage of meat in the greater weight. A well-bred and well-fed bullock of 120 imperial stone live weight may be estimated to yield from 61 to 64 per cent. of beef. If the same animal be fed up to 140 or 160 stone of beef it would probably yield near 68 per cent. of beef, whereas one of only 70 or 80 stone would not yield more than 57 to 58 per cent. In each case a well-bred heifer of the same weight will exceed the steer in its beef-producing qualities by 2 or 3 per cent. Newly-shorn sheep, weighing about 12 stone, would average from 63 per cent. to 65 per cent., and in proportion for larger weights if at the same time the breed be not one of the coarsest. The more finished the feeding the higher the percentage of meat to offal in everything.

A tolerably correct estimate of the weight of a beast may be ascertained by measurement, and the process is not a difficult one. But whoever undertakes to solve the problem in this way should himself be a good judge of a beast, and should know something as to the length of time the animal has been in the stalls, the kind of food supplied, and the characteristics of the breed. Cattle which fatten at an early age lay on more fat externally, whereas the late-fattening breeds have more internal fat.

The method of measurement, as summarized by Curteis is to take the girth immediately behind the shoulder, drawing the tape fairly tight; then take the length from the shoulder to the tail end, each place being determined by an imaginary perpendicular line let fall and clearing the fore and hind quarters respectively. Square the girth in feet, and multiply the result by the length and the product again by a decimal selected from the following: A moderately fat beast 0.23; fat 0.25; prime 0.26; very fat 0.27. The result gives the weight in imperial stones. But a simpler rule is to multiply the square of the girth in inches by the length in inches and divide the product by 7238, and the quotient will give the weight in imperial stones. Another rule is to multiply the square of the girth in feet by five times the length in feet and divide by 21, and we have the same results.

(1) RED-POLLED CATTLE.

The Red-Polled cattle of Norfolk and Suffolk have within the last two years gained an important place in public favor. Interest in the breed has been shown to such an extent that its history and its claim to recognition can no longer be said to be a mere local matter. These circumstances will doubtless be accepted by my readers as sufficient warrant for a brief notice of the Red Polls.

The history of Red-Polled cattle can be carried back well into the last century. Suffolk had from time immemorial its breed of Polled cattle, producing butter which, one hundred and fifty years ago, was asserted to be "justly esteemed the pleasantest and best in England." Arthur Young, in his "Survey" (A. D. 1794), defines the area "a tract of country 20 miles by 12, * * * the seat of the dairies of Suffolk," which, he said, must be peculiarly considered the headquarters of the Suffolk Polled stock, though he found the breed spread over the whole country. In this survey we get the first accurate description of the breed. Though Arthur Young makes no note of Norfolk Polled cattle, yet advertisements of sales held in and from the year 1778 prove that dairies of such animals were numerous in the county, and that they extended from the northern boundary of the Suffolk "headquarters" well into the center of Norfolk.

An old Elmham tenant, who survived till 1872, recollected Red-Polled cattle on the estate so long ago as the year 1780. At Shipdham they were greatly valued from a date certainly as early. At Necton they were kept from a remote period. The predominant breed in Norfolk at that time (see Marshall's "Rural Economy of Norfolk," notes written from 1780 to 1782) was, however, a "Herefordshire breed in miniature" and "the favorite color a blood-red, with a white or mottled face." Marshall, fortunately, preserves for this generation a record of the process by which the excellencies of this now extinct old Norfolk blood-red stock have been combined with the proverbial merits of the Suffolk Red-Polled. He says there were several instances of the Norfolk breed being crossed with Suffolk bulis, and that the result was "increase of size and an improvement of form."

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Color.—Color was, in the opinion of the old fanciers of Suffolk Polls, a distinctive characteristic. Mr. M. Biddell, speaking in 1802, could "recollect the time when no other color than red would be looked at in a Suffolk cow," and in the same discussion on the breed it was admitted that "the red cow had established the breed." Previous to that meeting of the Suffolk Agricultural Society there was a tendency being developed to get rid of the color distinction. This may have arisen from the remembrance of the fact that "red and white, brindle, and a yellowish cream color" had been an accepted color, as representing good milkers. In Norfolk, as has been said, red was the favorite color, but in a few districts sheeted Polls were preferred. The fashion has during the last forty years set steadily in one direction. The red which is now recognized as the mark of excellence is a deep, rich blood-red, and the spot of white, which Mr. George used to say was a sign of good breeding, has been well nigh crossed out. The predominance of deep red shows plainly the degree in which the old Norfolk breed has affected the Polls, and, on the contrary, the freedom from horns and from white on the udder and face is evidence of the persistence of the Suffolk Polled character. The amalgamation of the two varieties—Norfolk Polled and Suffolk Polled—may with certainty be traced from the year 1846. Both counties henceforth met in an honorable competition in the show-yard. Purchase of the handsomest and truest bred red stock became the desire of all the breeders. The result of the zeal was soon made evident not only at county shows but also at Royal meetings.

Characteristics.—The standard description of Red-Polled cattle was agreed upon by the breeders in the autumn of 1873, after my proposal to establish a herd-book of the breed had met with ready acceptance. This standard description read as follows:

Color.—Red; the tip of the tail and the udder may be white. The extension of the white of the udder a few inches along the inside of the flank, or a small white spot or mark on the under part of the belly by the milk veins, shall not be held to disqualify an animal whose sire and dam form part of an established herd of the breed and which upholds in all other essentials this "standard description."

Form.—There should be no horns, slugs, or abortive horns.

The points of a superior animal are as follows:

Color.—A deep red, with udder of the same color, but the tip of the tail may be white. Nose not dark or cloudy.

Form.—A neat head and throat. A full eye. A tuft or crest of hair should hang over the forehead. The frontal bones should begin to contract a little above the eye, and should terminate in a comparatively narrow prominence at the summit of the head.

In all other particulars the commonly accepted points of a superior animal are taken as applying to Red-Polled cattle.

Weight.—At the close of the last century the animals when fattened seldom exceeded fifty stone (720 pounds). This is the report both of Marshall and Young. The former says:

The superior quality of their flesh, and their fattening freely at an early age, do away with every solid objection to their size and form.

There has been great improvement in this matter of weight for age, while there has been no deterioration in the quality of the flesh, butchers now, as then, purchasing the Red Polls readily, because they die well, and the meat is equal to the best Polled Scot or Highlander. A few of the recorded weights of fat beasts will show this:

The live weight of a three-year-old steer, of the Biddell strain, shown in 1876, was 25 cwt., 2 qrs.; its girth nearly 9 feet. The return of this animal's dead weight has not been recorded; in fact, it has been found

most difficult to get such facts, though they are most useful for purposes of comparison. The two following records will, however, partially serve this end:

Mr. A. Taylor's Red-Polled steer, first prize at the Smithfield Club Show, 1881 (aged three years seven months, sire Norfolk, dam Suffolk), had a recorded live weight of 17 cwt., 1 qr., 1 lb. Its dead weight was 91 stone, 6 pounds (1,280 pounds), a percentage of 66.74 of the live weight. The same exhibitor's heifer (aged three years, one month, three weeks) had a live weight of 13 cwt., 3 qrs., 14 lbs. Its dead weight was 72 stone, 7 pounds, a percentage of 65.31 of the live weight.

Mr. J. J. Colman's prize cow, Fannie (aged ten years, three and a half months), which had produced five calves, had a live weight of 17 cwt., 22 lbs., and was sold by public auction at Ipswich at a sum which equaled 4.375*d.* per pound, calculated on the live weight.

The dead weight of a three-year nine-months old Norfolk steer, shown at Norwich in 1878, by the Prince of Wales, was 80 stone, 4 pounds; of Mr. A. Taylor's three-year ten-months old steer, first-prize winner at the same show, 111 stone, 12 pounds.

This record is nearly equaled by that of a bull of Mr. Lofft's breeding, which, when slaughtered in "fair condition only," gave a dead weight of 110 stone.

These are not mentioned as exceptional weights; they happen to be available because they were recorded at the time of slaughter.

Portraits of Red Polls.—Davyson 3*d* 48, the bull shown in the illustration, was bred by Mr. John Hammond of Bale, East Dereham; was sold as a two-year-old to Mr. J. Foster Palmer, and was subsequently bought at auction by Mr. W. A. Tyssen Amherst, M. P., at 205 guineas. He was calved in August, 1873, being of the Davy (H 1) tribe, and sired by a bull of Powell blood, as was his dam. He was the reserve at the Norfolk show of 1875, and since that year has never been beaten at a royal or county show, winning sixteen first prizes and six cups. Dolly (No. 2), calved November 3, 1879, the older of the two females in the illustration, was in Mr. Colman's cup collection in 1881, and again in 1882. In each year she was first in her class, and last year she also won the cup offered for the best Red-Polled cow or heifer at the Norfolk show. She is a heavy-fleshed animal, inheriting that characteristic from her great-great-granddam, Minnie, the foundress of a Necton tribe, and herself the daughter of the Red-Polled bull which won first prize at the Norwich Royal in 1849. This Minnie tribe realizes high prices, and is, as a rule, very good both for milk and for flesh. The sire of Dolly, and also of the other female in the illustration, was Rufus, a bull of Powell's famous Rose tribe, bred by the late Lord Sondes.

Silent Lady (O 9), calved December 18, 1880, the yearling heifer shown in the illustration, was also in Mr. Colman's cup collection of 1882. She traces back to one of Sir E. Kerrison's grand cows—a superior milker.

Milk yield of Red Polls.—Mr. Ewen recently gave a daily return of the milk yield of one cow, extending over eight months, and the monthly averages of four others in the Didlington House Farm herd. The cow, Davy 27th, whose daily record is given, is of the same tribe as Davy 24th, whose average yield for seven months was stated in the Almanac of the Live Stock Journal to have been 42 pints per day. Davy 27th was selected by Mr. Ewen to test the question of the value of the Guénon escutcheon theory as applicable to Red-Polled stock. She was fed in the ordinary Norfolk fashion, in common with the cattle in the large herd

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A GROUP OF RED POLLED CATTLE

DAVISON AND SILENT LADY DOLL

James H. H. & Co. Ltd.



owned by Mr. John Hammond. The following is the result of the trial:

Daily yield of milk, in pints.

[Davy 27th, H 1. Register No. 1451.]

Day of month.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1.....		48	48	41	40	39	36	34	26
2.....		48	46	41	40	39	36	34	24
3.....		48	42	41	40	39	36	34	24
4.....		48	42	41	40	39	36	34	24
5.....		48	40	41	40	39	36	34	24
6.....		48	40	41	39	39	36	34	24
7.....		48	38	41	39	39	36	34	24
8.....		52	38	41	39	39	36	34	24
9.....		50	38	41	39	39	36	34	23
10.....		56	38	41	39	39	36	34	23
11.....		56	38	41	39	39	36	34	23
12.....		56	38	41	39	39	36	34	23
13.....		56	38	41	39	39	36	34	23
14.....		56	38	41	39	39	36	34	23
15.....		52	37	40	39	39	36	34	23
16.....		46	37	40	39	39	36	34	23
17.....	Calved	44	37	40	39	39	36	34	23
18.....		44	36	40	39	39	36	34	23
19.....		42	36	40	39	39	36	34	23
20.....		40	35	40	39	39	36	34	22
21.....	16	40	35	40	39	39	36	34	22
22.....	13	40	35	40	39	39	36	34	22
23.....	20	44	35	40	39	39	36	34	22
24.....	34	48	35	40	39	39	36	34	22
25.....	42	48	35	40	39	39	36	34	22
26.....	42	48	32	40	39	39	36	34	22
27.....	42	48	33	40	39	39	36	34	22
28.....	48	48	31	40	39	37	34	33	22
29.....	44	48	36	40	39	36	34	33	22
30.....	44	48	36	40	39	36	34	33	22
31.....	48	46	36	40	39	36	34	33	22
Daily average for month	49.03	37.45	40.43	39.1	38.5	35.0	32.6	22.8	

Daily average for five months, 41.04 pints; for six months, 40.1 pints; for seven months, 39.01 pints. Total yield from September 1 to March 31, inclusive, 8,273 Imperial pints; to April 30, 8,057 Imperial pints.

The Diddlington herd tests were carried out by Mr. John Wallis, the steward, with the following results in pints:

Name of cow.	Date of calving.	September.	October.	November.	December.	January.	February.	March.	April.	May 1 to 31.
Wild Rose Cousin	August 28 (4th calf)	40	38½	38	36	34½	34	32	26	16
Golden Locks	September 7 (3d calf)	42	41	40	39½	37	36½	35	32	26
Gentle Rose	December 17 (3d calf)				34	32½	32	31½	30½	26
Fansie	January 4 (3d calf)					38	36	34½	33½	26

In England systematic tests for milk and cream are not carried out by the farmers. It is only natural to suppose that a cow whose average yield is 25 to 30 pints of milk per diem during two-thirds of the year, is more profitable than one which gives a good pail for half that period.

Nancy 2nd (K 19) dropped her fourth calf on August 9, 1881. In the week ending February 5, 1882, she gave 210 pints of milk; percentage of cream, as indicated in a graduated test-tube after the milk had been at rest twenty-four hours, 16.5. Each of the cows in the herd had, in February, a daily feed of 4 pounds mixed linseed and decorticated cot-

ton-seed cake, 4 pounds bran, 1 bushel carrots, and 1½ bushels barley straw and hay chaff. This cow, Nancy 2nd, when in full profit, August 31, was giving 36 pints of milk per day.

Davy 24th (H 1), shown three years in succession, dropped her second calf on January 27, 1882, and gave a daily average yield of milk from that date to August 31 of 42 pints; percentage of cream, 18. Cherry Leaf (V 3) dropped her third calf on May 16, and gave, to August 31, an average daily yield of 42 pints of milk. Flirt 3d (V 1), a cow of similar breeding to Cherry Leaf, gave, six weeks after producing her first calf, a yield of 249 pints of milk in the week; percentage of cream, 15. Wax-work 6th (U 9) (the tribe in which the bull Slasher is included) produced her first calf on January 8, and on August 31 was giving milk which yielded 21 per cent. of cream.

The following returns are from the Necton Hall herd (Mr. R. H. Mason's):

In the third week of February the cows were on pasture (very light land) most of the day, with a few roots; at night they each received 7 pounds cotton cake and spiced cake, 7 pounds bran, 14 pounds hay and cut straw. Nancy 3d (N 3), aged six years, dropped her calf in December, 1881; on February 18 yielded 23 pints of milk at two successive milkings; percentage of cream, 16. Pet (N 1), age 6 years, dropped her calf January 22; on 18th February yielded 23 pints of milk; percentage of cream, 35. Tulip (N 4), with similar conditions, yielded 25 pints of milk; percentage of cream, 34. And Tulip (N 7), aged 9 years, which dropped her calf in October, 1881, was yielding 26 pints of milk per day in February.

Tests were also taken at the end of August, when the cows were all at grass, with the following results:

Empress (N 4), which dropped her third calf on April 10, yielded 22 pints of milk per day; percentage of cream, 29. Sultana (N 5), which dropped her fourth calf on March 22, gave 30 pints; percentage of cream, 26.

The butter being produced by eleven cows in August was 80 pounds, and 120 pints of new milk were sold per week. In the year 1881, from the herd of 13 Red Polled cows, 8 heifers, and 1 Alderney, the produce of marketable butter was 3,120½ pounds; new milk sold, 725 gallons; cream sold, 101 pints; money value, independent of skim milk, £260. In the year 1882, from 14 cows, 6 heifers, and 1 Alderney, the produce of marketable butter was 3,434 pounds; new milk, 686 gallons; cream, 13½ gallons. The money realized was £281 4s. 2d.

Primrose (K 6), an eleven-year old cow in Lord Kimberley's herd, gave on winter feed (hay, chaff, bran, and cake), six weeks after calving, 32 pints of milk per day, and the marketable butter produced was 9 pounds per week.

Mr. Lofft, Troston Hall, reported the testing of two of his cows of the Handsome (U 3) tribe, each of which consumed per day 4 pounds cotton cake, 2 pounds Simpson's meal, 6 stone of beet root, and 1½ bushels of chaff. Handsome 5th, four months after calving, yielded 28 pints of milk per day and 7 pounds of marketable butter per week. Handsome 6th yielded 32 pints of milk per day and 10 pounds of butter per week.

Mr. G. Gooderham, Monewden, uniformly causes his cows to breed very early, and the secretion of milk is thus fostered. One of his cows, Wild Rose of Kilburn, which was first prize-winner as a yearling at the Royal meeting of 1879, produced her first calf when wanting two days of being two years old. Before she was three years old she produced a second calf, and again within twelve months a third. Eight weeks after this last calf was dropped she gave 30 pints of milk per day on winter feed, and her average of butter was 9 pounds per week, taking all the year, since she never goes dry. In June 1882, six months after calving, she won first prize at the Essex show as a milker; her dam won a like honor at the Suffolk show in June, 1881.

The herd of Mr. J. J. Colman, M. P., which has seven times in eight years won the cup offered at the Norfolk show for the best collection, includes the seven-year old cow, Silent Lass, the yearling heifer

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shown in the illustration.* This cow, on winter feed, gave 37 pints of milk per day, eight weeks after calving. In May, when the cows were at grass—very poor herbage, growing on a marsh—I tested the quality of the milk, using for the purpose Heeren's milk tester, the "pioskop" of the Hanover Vulcanite Company. The milk was drawn on to the pioskop direct from the udder, when milking had been half done. Silent Lass, five months after calving, yielded milk which contained more fatty particles than are found in rich milk as marked on the tester. Even the first milk drawn from the udder of Dolly, six months after calving, was "normal" according to the tester, and her average yield was very rich, as was also the yield of the other cows tested, Rosa (P 3), seven months after calving, and Rosebud 2d (K 17), nine months after calving.

Mr. Garrett Taylor's large herd at Whitlingham, near Norwich, is kept exclusively for the supply of milk to customers in the city. The cafés, which have a large demand for the article, have familiarized the public with the fact that the milk of the Red-Polled cattle is exceptionally rich. One of the Whitlingham cows, on winter feed, five weeks after calving, gave 32 pints of milk per day; another, 27 pints.

Mr. B. Stimpson, of Morton, reported two of his cows, on winter feed, as yielding daily, Cheerful, ten weeks after calving, 30 pints of milk, and Silky, six weeks after calving, 26 pints. The butter made from their milk amounted to 14 $\frac{1}{2}$ pounds per week.

A four-year old cow of the Eaton strain, in Mr. J. F. Rogers' herd, at Swanington, yielded, five weeks after calving, on very poor food—hay, pulped swedes, and cut straw, with 3 pounds of decorticated cotton cake—28 pints of milk per day. His herd of seven cows (six Red-Polled and one Shorthorn) produced in the year ending September 30, 1882, 1,435 pounds of butter, which, with milk sold amounting to £11 18s. 1cs., made the total return £118 15d. 3s.

A return of the test of two cows of the Glemham strain (Mr. Moseley's), already mentioned (in Mr. J. M. Spink's herd, Harpley), gave 53 pints of milk as the yield per day on winter feed, and 23 pounds 2 ounces or butter per week.

Red-Polled cattle are found to lay on flesh rapidly on pasture of the poorest character, where other breeds need to have an additional supply of richer food. The dry temperature of Norfolk and the poor pasture seem more particularly to have had their effect on the size of the stock. The first cross stock sired by a Red-Polled bull, no matter of what horned breed is the dam, is usually red in color and polled in character. Such animals when fat are eagerly bought by the butcher. I have recently seen a number of such cross-breeds, the produce of a Red-Polled bull and a pure-bred Jersey cow, and am told the cross is an excellent one. Some of the animals have a few silver hairs mixed with the red coat; all were polled and all had black noses.

The chief hindrance to the extension of the breed exists in the scarcity of the stock which has in great measure arisen from the fact of rinderpest having a few years ago been fatal to a large proportion of the cattle then in the more noteworthy herds. Fashion also had a marked effect. Shorthorns and Devons were at one time in such favor that polled cat.

* The yearling in the illustration is the "Silent Lady," not the "Silent Lass," and, according to Mr. Long, was calved on the 18th of December, 1880, and was consequently only about four years old at the date on which his report was written. It would therefore appear as if the "Silent Lass" here referred to is another than the cow "Silent Lady" shown as a yearling in the illustration, or that an error has been committed in the age as well as in the name. (Note by the Department.)

tle were desired and their merits ignored. With registration, however, and the progress made in Red-Polls within the last ten years, the shortness of numbers is being in some measure compensated for, noblemen and gentlemen now sparing no pains to make the breed a success.

Weight and measure of Red Polls.—Mr. Tyssen-Amherst, M. P., of Didlington Hall, has, at my request, weighed and measured several cattle in the Didlington herd with the following results, the stock living entirely on the grass of very poor land:

Name.	Age.	Weight.	Length from point of shoulder.	Total length.	Girth.
BULL.					
Davyson 3d	Years 9	Pounds. 2,093	Ft. In. 5 2	Ft. In. 7 10	Ft. In. 7 10
COWS.					
Davy 24th (H 1)	5	1,344	4 9	6 9	6 9
Dolly (P 9)	5½	1,320	4 6	6 4	6 4
Wild Briar (B 9)	6	1,436	4 11	6 8	6 8
Pretty Flower (B 18)	6	1,427	5 00	6 7	6 7
Pansie (B 20)	6	1,281	5 2	6 8	6 8
Bertha (A 20)	3	1,354	5 00	6 9	6 9
Cheerful (K 19)	7	1,514	5 2	6 6	6 6
Nancy 2d (K 19)	8	1,650	5 2	6 9	6 9
Countess (L 11)	8	1,350	5 2	6 6	6 6
Dolly (N 6)	6	1,472	5 2	6 6	6 6
Nancy (N 15)	9	1,649	5 2	6 6	6 6
Satin (T 7)	3½	1,358	4 8	6 7	6 9
Norfolk Witch (W 14)	5	1,387	4 7	6 7	6 7
Poppy (U 8)	2½	1,484	4 11	6 10	7 1

Slasher, 577, bred by Mr. Lofft, combining Norfolk and Suffolk blood, had a live weight of 27 cwt. (3,024 pounds) at the age of four years seven months; girth, 8 feet 2 inches. His son, Rollick, 538, of the same tribe as Dolly, No. 2 (see illustration), weighed at the age of two years eight months eighteen weeks, 19 cwt., 3 qrs., 14 lbs. (2,226 pounds), and its dead weight was 100 stone of 14 pounds. The bull Cortes, 645, weighed when one year eight months old, 12 cwt., 20 lbs. (1,363 pounds); eight weeks after, his live weight was 12 cwt., 3 qrs., 9 lbs. (1,437 pounds); girth 6 feet 10 inches. King Egbert, 688, at fifteen months three weeks, weighed 10 cwt., 3 qrs., 2 lbs. (1,206 pounds); girth 6 feet 6 inches. Three bull calves at Didlington, under five months old, all the get of Davyson 3rd., had a live weight of 3 cwt., 1 qr. (364 pounds); 3 cwt., 14 lbs. (350 pounds), and 3 cwt., 12 lbs. (348 pounds), respectively. A Davy heifer at Didlington, sired by Davyson 7th, and calved January 27, 1882, had on May 31, 1883, a live weight of 8 cwt., 1 qr., 14 lbs. (938 pounds); girth 6 feet 1 inch. A Primula heifer, calved January 3, 1883, weighed on the following May 31, 3 cwt., 1 qr., 20 lbs. (380 pounds). A Red-Polled calf at birth has been found to weigh 3 qrs., 10 lbs. (94 pounds).

Practical experimental breeding of Red Polls.—Mr. R. E. Lofft, of Bury St. Edmunds, a famous breeder of the Red-Polled variety, gives some very unusual information. He says:

My farm is composed of drift clay and sand, or both intermixed, and rests on a substratum of chalk. The mean temperature of 1883 was 48.6; rainfall 26.19. I have never tested my dairy, but only a few cows, on request. Good cows give from 4 to 6 gallons of milk per diem, and make 7 to 10 pounds of butter per week. I set more store upon cows milking through than on giving a large quantity after calving. We have had cows that have not been dry for four years, but this is of course exceptional. I am breeding cattle of three different sizes: First, a large size more exclusively for beef. Of this sort a bull might weigh 1 ton to 1 ton 7 cwt.; a cow from 15 to 17 cwt., and a

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Birth n of der.	Total length.	Girth.
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steer at two years old, 12 to 13 cwt. Second, a middle-sized animal for general purposes, milk and beef combined. A cow of this sort might weigh 11 to 13 cwt., a bull about 15 to 18 cwt., and steers at two years old in proportion. Third, a small-sized animal exclusively for milk. This at first I am trying to breed as small as I possibly can, with an abnormal development of milk. I have now been breeding this sort for some two years, and I fancy I shall be able to breed animals smaller than either Kerry or Breton cows.

I have now been breeding Red Polls for about thirteen years; my present herd consists of about 70 head of cows. Up to this time, I have not been able to weed out as freely as I could wish, as Red Polls are scarce. Now, I shall be able to draft a number for fattening purposes every year. As a rule I only sell calves, or young bulls of about two years old. I prefer to fattening off cows to selling them for breeding or milking purposes. My fat steers are generally sold rather under than over two years of age; heifers that are rejected for some reason or other, generally have a calf and are fattened off at three years.

I consider the Red Polls to be a color variation of the old Suffolk cow, which is of a light yellow or pale ginger color, and I fancy it too is a color variation of the old original White Polled cow kept by the monks, and now in a few instances kept tame in noblemen's parks. I have the mind to set up two small dairies of these two varieties; I have already secured some and got the promise of others. My present herd is comprised of about equal parts of blood from Norfolk and Suffolk stocks. I am in favor of line breeding, unless, of course, it shows bad results. My idea of breeding in three different sizes is quite contrary to the usual ideas upon the subject, but for the present I see no reason to regret the course I have taken. As far as I can see, judicious selection is more prepotent than either food or climate. The fact that I hope, starting with the same blood and food and other conditions of existence, to produce animals that weigh over 1 ton, down to animals that only weigh 3 cwt., as I feel quite certain I can, points to the same conclusion. When I first began to breed Red Polls, they had short wire coats, but now they have long silky coats, with soft melon skins. As far as I can see, a first-class milking habit is more difficult to fix in a breed than any other characteristic; the material may be present, but one cow stores it up and another yields it up to the milkman. Cows that are good milkers often breed heifers that are only the common run, although put to good bulls out of good milking strains.

As regards the proportion of lean to fat, Red Polls have on the market a good reputation, and fetch advanced rates; some price as much as a shilling per stone more than Shorthorns.

My cows are fed on a great variety of food, according to the crops of the year. In summer they are out at grass from May to October; at times they have a bait of cabbages or turnips on the pastures, with 2 to 3 pounds of cotton cake or linseed; sometimes lucern in the barn, or they may be turned out to clover. In winter they are fed with cake, hay, cabbages, swedes or turnips, or gorse, with a few bushels of meal, just as it may happen. Grains as well as malt dust is good food, but all depends on circumstances—such as home crop or cheapness of artificial food.

As for the working powers of the Red Polls, I have never worked them myself, as I am a large horse breeder, but they can be worked with a collar. I have seen some working in America, but never in England.

Since the above was written I have received the following information from Mr. Gooderham, the well-known breeder of this race, whose cattle are so famous for their milking qualities. He states that the annual average yield of milk per cow is about 1,000 gallons, and that 20 pints is the usual quantity required to produce a pound of butter. He does not manufacture cheese and is, therefore, unable to give the quantity necessary to make the like quantity of that article. The live weight of the Red Polls, he informs us, is from 1,400 pounds to 2,000 pounds, at maturity, and that the proportion of meat of a fattened steer, also at maturity, is nearly equal to that of a Scot. His land is composed mostly of heavy clay, and his grasses consist chiefly of old pasture. The summer food of his Red Polls is 4 pounds of best linseed cake daily, with grass. In winter he feeds them upon cut long turnips, swedes, mangolds, and carrots, or cabbages. In the early part of the winter he prefers feeding them with two bushels of swedes and carrots, and with the like quantity of mangolds in the spring.*

* For much of the special information given in the foregoing report on Red Polls, Mr. Long expresses his obligation to Mr. Euren, editor of the Herd-Book, and to Mr. Loft, the famous Suffolk breeder.

(2) LONGHORN CATTLE.

The Longhorn cattle, as a distinct breed, became famous first of all in the district of Craven, in Yorkshire, on whose phosphatic soils they attained a degree of inherent vigor and hardiness which their descendants have faithfully transmitted through many generations, in various kinds of climates, and on widely-differing soils. Long before the Shorthorns became famous outside the Teeswater district, the Longhorns had attained a proud position and a widely-extended popularity. During the greater part of the last century, and in the early years of the present one, they were at once the pride of wealthy breeders, and, in varying degrees of purity, the practical stock of dairy farmers in the midland counties of England. In Ireland they were and still are known, in contradistinction to the modern breeds reared there, as "the old Irish cow."

Though the Longhorns, less, as well as more, than a hundred years ago were the prevailing cattle of the midland counties, Derbyshire appears to have been then, as it is now, the stronghold of the more famous herds. Sir Thomas Gresley, of Drakelow House, Burton-on-Trent, appears to have been the first prominent improver of Longhorns, and he took "delight in keeping a dairy of cows similar in color and shape" before the renowned Robert Bakewell was born. Three-quarters of a century ago, Mr. Princep, of Croscall, is said by Parkinson to have had, perhaps, the first dairy of cows in the county where that pre-eminence is defined to mean symmetry, size, and aptness to fat. The same authority tells us that Mr. Princep had 500 guineas offered for a two-year-old bull, and 30 (another account says 50) guineas a cow for the use of his bull to 30 cows; and he was also offered £2,000 for 20 dairy cows.

A four-year-old steer of his weighed, when killed, 248 stone of 14 pounds to the stone; and, in addition, there were 350 pounds of fat, while the hide weighed 177 pounds. The breed, however, had previously become supremely famous under the hands of the greatest of all breeders, Mr. Bakewell, of Dishley, in Leicestershire, whose efforts, eminently successful as they were, lay in the direction of combining in the same animal the four great qualities of beauty and utility of form, quality of flesh, and aptitude to fatten, which, he rightly judged, were not incompatible with each other. But, in attaining these points, he wholly neglected the no less important one of milk, and we cannot but regard this omission as a national misfortune, for numberless other breeders have been taught to sin in the same way. Mr. Lythall, editor of the recently established Longhorn Herd-Book, makes the startling assertion that to this line of breeding "must be traced the decline of the Longhorns in public favor at the early part of the present century." This is quoted as a warning to the Shorthorn breeders of the present day.

Yet the old Longhorns, even many of the highly improved ones, were celebrated for their milkiness, less though for quantity than for quality of milk; but it was Bakewell's one fatal misfortune to destroy this reputation. Youatt says of him:

Many years did not pass before his stock was unrivaled for the roundness of its form, the smallness of its bone, and its aptitude to acquire external fat, while they were small consumers of food in proportion to their size; but at the same time their qualities as milkers were very considerably lessened. The *grazier* could not too highly value the Dishley or new Leicester Longhorn, but the *dairyman* and the *little farmer* clung to the old breed as most useful for their purpose.

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MR. R. HALLS LONGHORN BULL, "DAREWELL."



Julius Allen & Co. Lith.



HEAD OF LONGHORN COW.

Julius Bené & Co. Lith.





Engr. Penn. & Co. Phila.

SIR JOHN CREWES PAIR OF LONGHORN STEERS

From the original in the possession of Sir John Crewes

It would thus appear that the "unimproved" Longhorns were good milkers, or the dairymen and little farmers would not have thought so much of them. Whilst Bakewell was alive there were many famed herds of Longhorns within an hour of him in the saddle, but in less than forty years after his death there was not an animal of the breed left on the old farm at Dishley, and not a dozen within a circuit of 12 miles from it, so completely did the loss of milkiness disestablish the old breed from the district in which Bakewell had made it immortal.

Three quarters of a century ago Mr. Mundy, of Markeaton, was a well-known breeder of Longhorns, and it is related that one of his cows, named Thistle, made 17 pounds of butter a week. Mr. Cleaver, of Leamington, tells of a brindled cow he knew almost as long a time ago which filled a 4 gallon milk-pail up to the brim, and afterwards gave another quart to the milkmaid; and of a two-year-old heifer which was so prolific that in ten years she brought thirteen calves, and was such a milker that all the dairymaids set a world of store by her. Mr. Shaw, of Fradley, Old Hall, near Lichfield, says:

A Longhorn cow some years ago, on Lord Bagot's estate, near Rugeley, had such an immense udder that the man when he sat down to milk her could not reach across it, and had either to milk one side first and then the other, or two men would be milking the same cow at once; and he records his opinion that very few, if any, breeds of cattle excel the old-fashioned Longhorn for milk.

And as to its quality he says:

Whenever we have had occasion to change our dairymaids the new ones have invariably been struck with the superior quality of the milk and cream obtained from our Longhorns. One of them remarked, "Dear me! what a thickness your cream is; and the skimmed milk looks as good as the unskimmed did where I last lived; it does not look at all blue, and the other did."

The maid had been previously living where a large herd of Short-horns was kept.

Mr. R. H. Chapman, of St. Asaph, remarks that the Longhorns were numerous in some parts of Wiltshire forty or fifty years ago, and they were called the "Spreads," the "Bradles," the "Crumbles," or the "Broads," as the forms of the horns indicated. It is true there is no sort of uniformity either in the length or form of the horns of Longhorn cattle. It was said of them—

They were distinguished from the home breeds of other counties by a disproportionate and frequently unbecoming length of horn. In the old breed this horn frequently projected nearly horizontally on either side, but as the cattle were improved the horn assumed other directions. It hung down so that the animal could scarcely graze, or it curved so as to threaten to meet before the muzzle and so also to prevent the beast from grazing; or immediately under the jaw, and so lock the lower jaw; or the points presented themselves against the bones of the nose and face, threatening to perforate them.

The color of the Longhorns is sometimes the opposite of ornamental, and a white irregular streak commonly runs up the back from the tail to the shoulders. But, as a rule, they are picturesque and pleasing cattle, the color being most commonly brindle. It cannot be denied that as a breed they possess valuable points. They have, under proper management, early maturity, fatten well on a moderate quantity of food, and their flesh is of good quality; and while some of them are very deep milkers, they are all favorably known for the quality of the milk they give. It is not likely, however, that they will ever reattain the position they formerly held, but it may be confidently anticipated that their reputation can only be said to have declined, if at many breeders their reputation can only be said to have declined, if at

all, in part and temporarily, and it is equally true to say that there are many signs of an extended revival of the ancient reputation of this quaint old breed of cattle. Many splendid specimens have been and still are exhibited at the Birmingham fat-stock shows, and it is hoped this will always be the case, for to Birmingham is due the credit of having stuck to the old breed during a good part of the period when it was left out in the cold by most other agricultural shows. The number of Longhorn herds is increasing in the midland counties, and the names of many gentlemen mentioned in the Herd-Book index are an ample guarantee that the old breed will not only not be let die, but that it will again be helped on into popularity.

Characteristics of the Longhorns.—The characteristics of the breed are noteworthy, for it possesses a character of its own, resembling, however, the Herefords more than any other breed. The head is finely cut, but long, and tapers well towards the muzzle, being moreover well set on to a thin, shortish neck. The horns are, except in the bulls, long, fine, and tapering, hanging well down by the cheeks and then point forward by the muzzle; the usual length in the cows and oxen is from 2½ feet to 3 feet, but those of the bulls rarely exceed 18 inches. The shoulders are comparatively fine, but well set on, and the legs show good bone. The girth is for such cattle, in comparison with the Shorthorns, small; but the loin is broad and the hips wide and outstanding. The chine is rarely full except when the animal is fattening, and when it will put on a rare amount of flesh in this part. The thighs are long and fleshy, with small, clean cut legs. The hide is of fair thickness, mellow, and soft to the touch. The flesh is of fine quality, the bone plenteous, but not coarse, and the offal small. Regarded as graziers' stock, they possess sterling qualities and must take high rank, their carcasses carrying very heavy loads of beef. They fatten rapidly and easily, and although scarcely coming to maturity so quickly as the Shorthorns they nevertheless approach these, their supplanters, very closely, leaving very little to be desired in this respect.

As milkers, one admirer of the breed says:

We know them to be excellent cattle, as witness the fact that the majority of the pure breed Longhorn herds are kept as dairy cattle. They are free and long milkers, the milk being, as a rule, superior in quality to that of Shorthorns. Their use for crossing purposes is not very extensive, because there are few instances in which their place can advantageously be taken by the Durham, and it seems as if we must be content to use them as a pure breed. No doubt there is room for them, and we are inclined to the opinion that the judicious intermixture of a little of the Longhorn among one or two breeds would tend to reduce that fineness of character which is becoming dangerously general in some of our best kinds of cattle.

With regard, however, to the milking value of the Longhorns as a breed, a great deal cannot, we think, be said, for justly esteemed as it formerly was it has of late been comparatively little bred for this purpose, the Shorthorn having taken its position in the dairy in almost the whole of the Longhorn district; but there are numerous instances of great milking capacity in the breed, and we believe that by a little attention in a judicious crossing and in cultivating the milking power, it could be raised to a very high standard, certainly equal and possibly superior to the Shorthorn.

As with some of the other less cultivated breeds, the Longhorn is not now bred for the dairy. There are a few isolated cases in which they are used, but we very much question their absolute purity, and even in these cases the dairies are so small that statistics would be of little value. It may be generally stated, however, that it is a better cheese-

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making than a butter-making breed, and does extremely well upon the rich old pastures of the midland counties of England, which are not greatly exposed to the weather, and which are usually of a stiff loam, with a substratum of clay. The Longhorn, which lives to an exceedingly old age, is, moreover, a decidedly large breed, and in the year 1882, at Birmingham, the winning steer, aged 3 years 7 months, weighed 17½ cwt.; the second prize, 3½ years, weighing 15½ cwt. At the same time the first-prize cow, 5½ years, weighed over 16 cwt.; the second prize, a heifer, aged 4½ years, being 15½ cwt. The following year, at the same exhibition, the first-prize steer, 3 years 8 months, scaled 17 cwt., the second and third being almost as large; while in the cow class the first prize, 4 years and 10 months old, weighed 13½ cwt., the others being all larger.

The prevailing color of the best exhibition beast is brindle and white or red and white, the former being preferred.

As may be expected from the extraordinary length of the horns of these beasts they are seldom used upon the farm for draft purposes, although their docility and great strength otherwise fit them for such a purpose; but the farmers in the district in which they are chiefly bred almost to a man prefer horses.

Productiveness of the Longhorns.—The system of feeding is generally that adopted with the Shorthorn, cake and roots being the principal part of their diet, and both suiting them admirably. At the same time there are differences of opinion as to the quantity of turnips given, some breeders preferring a minimum quantity with a maximum quantity of cake; others again, and it must be confessed without much reason, giving an enormous quantity of roots and a similar quantity of cake or corn. It was the custom in some districts not very many years ago to compose the dairy herds of Shorthorns and Halfhorns, the latter of which were, for the most part, a combination of Shorthorn and Longhorn; but of late years very little of the Longhorn element has been introduced among them. Of a herd of 25 to 35 of these, a cow would give from 3 cwt. to 4 cwt. (the long hundred of 120 pounds) of cheese during the season of about seven months, the price being sometimes as low as 50 and as high as 95 shillings per cwt. Of an experiment with 6 Shorthorns and 6 Longhorns in the June season, it was shown that whilst the majority of pounds of milk was 152 pounds to 135 in favor of the Shorthorn, the cheese curd from the larger quantity was only 14½ pounds, as against 19½ pounds.

Another experiment with 36 Shorthorns against 32 Longhorns showed that the 605 pounds of milk from the former made 66½ pounds of curd and that the 553 pounds from the latter made 69 pounds. The plainest cows are often the best milkers, and the milk from a seven or eight year old is thought to be the richest. In winter they are most frequently kept on barley straw and pulped turnips, with hay in addition near calving time. The calves, which generally are somewhat difficult to rear, are usually dropped in March and April, and some of them never suck their mother. They have new milk from the first, which is lessened when the cheese season begins, and gradually they come to oil-cake and linseed boiled in whey or the overnight's milk. As they get older they become heavy-fleshed and prove themselves well fitted for the butcher. For the food which the Longhorn consumes it will certainly give as good a return, and generally a better, than other beasts, and as an animal for the adornment of the park or the home pasture of the hall or grange it will be found most suitable.

(3) THE SHORTHORN CATTLE.

The Durham, or Shorthorn, is not an ancient breed. It cannot lay claim to such antiquity as the Longhorn; for while the Longhorn seems to have been the aboriginal cow of Ireland, the Shorthorn is a cow of modern days.

"Diversities in appearance, shape, habits, and produce," says a well-known writer on cattle breeds, "have arisen, partly from modern artificial breeding, but chiefly from the prolonged and combined influences of soil, climate, pasturage, and general treatment." The centuries that have elapsed since the dispersion of the ancient breed of cattle, and their long-continued location in different districts, under such varied conditions of climate and pasturage, have produced great changes in the appearance of members of the same race. Especially is this so in the case of the cattle whose home has always been in the more civilized and more highly cultivated parts of England. Originally of a shy and nervous disposition, spirited and active, of hardy constitution, and with a tendency to roam at will, they have, during the course of so many years of intercourse with their owners, lost much of their hardness and activity, and also much of their nervousness and fear. Rich pasturage, mildness of climate, protection from the winter storms, the increasing use of grain and artificial foods, and the general improvement in cultivation, has had a most marked effect on the appearance and general characteristics of the cattle brought within such influences. This is shown in the development of a surprising bulk of flesh on a much larger frame. The successive conquerors of Britain—the Romans, Saxons, Danes, and Normans—it must be remembered, all brought with them cattle from their own countries, and these, becoming domesticated, were mixed and crossed with the above, and were finally lost in the resulting race. The conquered area provided an improved breed of cattle, while the more remote and inaccessible parts of the Kingdom, remaining free, bred the same animal as existed in the early days of British history.

About the year 1640 a bull and some cows were brought into Holderness (East Yorkshire) from Holland. They had large shoulders, flat sides, coarse necks, thick heads; their valuable points were small and their coarser points large; yet these cattle were of larger bulk and the cows better milkers than were then known, and on this account they were greatly esteemed and used for crossing with the native cattle. The cross soon showed great and lasting improvement. Holderness is a rich grazing district, and the native cattle found there at that period were of the best in the land. The new breed thus formed by the admixture and crossing of these imported animals soon asserted their superiority over all other races. Such was the origin of the Shorthorn.

Another source of the Shorthorn, and in some degree passing the prior claim to being the original, was a race of cattle which from time immemorial had existed in Durham, in the basin of the Tees, whence they were named the Teeswater. In color and appearance they resemble the breed of the present day; they had a good, mellow touch, and in butcher's parlance "killed well;" were light of offal, had wide carcasses and deep forequarters, and were greatly esteemed by all who were acquainted with them. About the same period, or a few years later than their introduction into Holderness, the Dutch cattle were also imported into the valley of the Tees and were crossed there with the native breed, giving rise to the Teeswater Shorthorn, or Durham. At a still later date numerous bulls were imported from the Continent, principally from Holland. The native cattle in Yorkshire and Durham were crossed with

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MR. J. S. BULL'S SHORTHORN OX.

FIRST IN HIS CLASS AT ISLINGTON



Julius Rosen & Co. Ltd.



M^{rs} FITZHARDING'S SHORTHORN HEIFER LADY WILDEYES FIFTEENTH.

Julius Benck & Co. Lith



MRS. L. RAWSTORNE'S SHORTHORN COW "LADY WELLESLEY SECOND."

—Edwards & Parry's Lith.

THE CROSS BREECH



A DAIRY COW.
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them, and the new breed so produced received the name of the Short-horn.

It is not necessary to follow the history of the breed further. As it became known it came into popularity and quickly spread and multiplied. About the year 1754 the brothers Collings, of Darlington, entered upon a new departure in the history of this new breed, applying Bakewell's principle of selection in the breeding of the Shorthorn; a step which produced the happiest consequences and the most important results, improving the frame and proportions of the cattle, and largely developing and increasing their milk and fattening properties. For many years they followed this course, and when the herd was dispersed in 1810 the prices realized at its sale were altogether unprecedented. Since then much has been done by many persons to improve the breed.

It would be impossible to particularize those who have done such great service, but we may mention the names of Bates (whose great success must be largely be attributed to his purchases at Collings's sale), and of Booth, the founders of two great families of Shorthorns whose fame is without compare.

The points of the Shorthorn.—The color may be entirely red or entirely white, or a mixture, either color predominating, but not in spots. The fashionable color has varied at different times. Once a creamy white was all the rage; so was all the red, and the flecked roan, but a good Shorthorn cannot be a bad color so long as it is not spotted. The skin around the eye and the bald of the nose should be of a rich cream color, the head rather small in proportion to size, and tapering in shape, with a fine muzzle; a clean, calm, and prominent eye; horns rising near the crown, short, smooth, and white, but moderately sharp, and of fine quality; the head should be well set on a deep form and broad neck. As to the frame, it should approach as exactly as possible to the shape of a parallelogram, from whatever direction viewed; the back perfectly straight and level from the neck, just below the horns, to the top of the tail; the shoulders well back in the body, and the brisket projecting in short rectangular form. The top of the shoulders should be perfectly level and the loins wide and level across the hook bones; the hind quarters long and straight, as should the shoulders, forming perpendicular and well-marked lines; the buttocks to the hocks, and the shoulders to the knees full and well developed, but below the bones should be fine and clean and clearly formed; the twist full and wide; the flank full and thick, and the tail moderately fine, and not too much covered with hair. The ribs should be inclined to the shape of a barrel, but when the animal is seen along the side, it should appear as if perfectly straight and level from the shoulder to the buttock. When seen endwise, it should be equally straight and level from the top of the neck to the root of the tail, and also underneath from the brisket along the belly towards the twist. The hair fine and abundant, soft and glossy; the skin mellow and soft to the touch; the flesh is accumulated on the valuable parts, the fat in due proportion to the lean, and the flesh of the slaughtered animal is fine in quality, well marbled, and the meat most juicy and tender. In the bull the head is broader and thicker, and the neck is arched and coarser. In the cow the belly is more pendulous; the thighs slighter, and the loins sometimes hollow.

The appearance of the Shorthorn is exceedingly attractive and symmetrical; its skin is of the richest hue, from the blood red to the pure white or cream or the beautiful delicate roan. Its small clean limbs and handsome appearance have stamped it as the most magnificent breed of cattle we possess.

Valuable properties of the Shorthorn.—The valuable properties of the Shorthorn as a meat-producing animal are said to be without rival. It produces the greatest quantity of beef, and that of the best quality, and scales the heaviest of any of our herds. It also comes to maturity at a very early age and shows the most kindly disposition to fattening. As a milk producer, the Shorthorn can claim to be in the front rank, though the general opinion is that it must yield the palm to the Jersey and the Ayrshire. For many years past, it must be borne in mind, the breeding of Shorthorns has been conducted solely with a view to the production of beef, but formerly this animal was the deepest and heaviest of any of the milk-producing breeds, and if for a few years it was again bred for the pail, as it is now for the butcher, its superiority as a milker might be regained. As a cheese producer the Shorthorn is admittedly the best. The Shorthorn is to be found everywhere, but its home is in its native place in Yorkshire, and in the eastern counties of England. It is to be found all over England, Scotland, and Ireland, all over America, in Australia and New Zealand. Of all the different breeds of cattle we possess, the Shorthorn has the greatest power of adaptation to varying conditions of life, to changes of soil, of climate, and of pasturage. It thrives nearly as well in the cold, dry northeast of Scotland as in the moist and genial south of Ireland, and is equally at home in the nobleman's park and upon the prairies of Texas.

Shorthorn cross-breeds.—But while it is esteemed of great value on account of adaptability to all climates and soils, it has achieved wonderful results through crossing with other varieties. Crossing with the Shorthorn improves nearly all other breeds by imparting the properties that give value to cattle, viz., size, form, quality, rapidity of growth, early maturity, and aptitude to fatten at an early age. Most especially marked is the improved quality and consequently greater value of the cross between the English Shorthorn and the old Irish cow. The marvelous result is presented in an increase of ten imperial stones' weight of flesh in the animal, in greater size, and in the quality of fattening at least a year earlier than other stock. The enormous improvement that has been effected and that is still being carried on in the breeding of Irish cattle is within the knowledge of every farmer. This improvement has added no less than twenty-five per cent. to their value at a year old, and is the result of crossing with the Shorthorn during the last and present generations.

The Shorthorn is used in Scotland for crossing with the Ayrshire, and it is said that the produce are better milkers than their mothers. It also crosses with the Guernsey with great milking results. It is, however, for the size, the early maturity of growth, and the aptitude to fatten early and quickly that the Shorthorn imparts to other breeds of cattle that is chiefly valuable. Shorthorn steers, or steers of some other breed with a very large admixture of Shorthorn blood, are the favorite cattle for winter and summer feeding in the northern and midland counties of England. In some quarters the Shorthorn may not find so much favor as it once did, and in certain districts other breeds may be more successfully reared and fed; but, for general purposes, upon moderately good land, and in an average climate, the Shorthorn, as a race of cattle, is equal to any, while it is surpassed by none. Distributed throughout almost every county of Great Britain and Ireland, pedigree Shorthorns are now to be met with; there are probably some 600 breeders, possessing about 20,000 cows, and distributing good bulls amongst the breeding herds. But breeders of first-class Shorthorns,

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says Mr. Dun, have of late years been very generally looking to beef rather than to milk.

How to form Shorthorn dairy herds.—Some sensible and far-sighted breeders have seriously demurred to the neglect of the milking properties of the Shorthorns. Mr. Bates was opposed to overfeeding, kept his stock in a very healthy natural state, and some of his best cows were deep milkers. Mr. Whittaker for nearly forty years maintained the dairy superiority of his Shorthorns, which not only reared their calves, but supplied the people of his extensive factory with milk. He never used bulls excepting from cows which reached a high standard of dairy excellence. Although his famous bull, Fairfax, was the most shapely he ever bred, he was hired to go to Warwickshire, became the sire of many good steers and of a Smithfield gold medallist, but Mr. Whittaker would not use him at home, as he did not consider his dam a sufficient milker. The late Lord Ducie was equally anxious to preserve the milking qualifications of his herd, and was a staunch opponent to overfeeding. The forty-nine cattle at his great sale in 1853 were in very ordinary condition and many were exceedingly good milkers. From these, and other such tribes, where reasonable pains have been systematically taken to maintain milk, pedigree Shorthorn cows can be obtained which will compare with any dairy stock. From such herds young bulls can be selected which may be trusted to produce vigorous, good, thriving animals, with early maturity, good all round, and which will not detract from the dairy profits of the herd with which they are mated. By the use of such sires good thriving young stock are produced, which make the best of their food and time, which, whilst they milk as well as their dams, probably acquire, when dry, greater capability rapidly to lay on beef. I need not here enlarge on the enormous boon it is to the dairyman to have his cows maintain their condition while milking, readily to lay on beef as they are dried, and if required shortly to go to the butcher at about the price they were valued for calving. This combination of good qualities—this milking liberally for eight or nine months, and making, if needful, three or four months later, a good carcass of beef—is pre-eminently secured more rapidly and effectually by Shorthorns than by any other breed.

A very valuable herd of pure-bred dairy Shorthorns could be inexpensively founded in a few years by attending Shorthorn sales, selecting animals merely for their dairy qualities and without regard to fashion or tribe, and mating them with a bull carefully chosen from a heavy milking cow of a well-known dairy sort, such, for example, as the Knightleys. My herd contains animals that have milked twenty-four quarts per day each without any special forcing and milked only twice a day. With more stimulating food and an extra milking even larger results might be obtained. I am inclined to the opinion that pure-bred Shorthorns give richer milk than common-bred cows of no particular type, but no doubt the proportion of cream is affected by the kind of food and quality of land. Bean meal is a favorite "licking" for milk cows with the Yorkshire men; cotton-cake stands next; grains, distillers' wash, and other like articles, whilst increasing the flow, diminish the quality of the milk. Twenty years' experience in milk-selling and Shorthorn breeding brings me to the conclusion that £500 invested in pure-bred Shorthorns, selected solely as dairy animals, and kept to yield milk for sale, weaning and rearing the calves, and selling off the dams as fat when no longer serviceable in the dairy, would in ten years leave netter profit than the same amount laid out on any other breed for similar purposes.

In selecting young bulls for dairy herds it is not only essential that they are descended from dams and tribes which have the desired milking capabilities; they ought, also, to carry in their own persons some recognized characters indicative of dairy usefulness. Size, substance, and masculine character, are essential for health and vigor. Close-made, compact sizes, although sometimes captivating on account of shapely, even form, are rarely good getters, either of steers or dairy cows. There is a happy medium between smart heifer-like or steery-bulls, and rough, coarse leggy brutes. The head should be kindly, free from coarseness, but withal of a masculine character, without which a bull is unlikely to leave his mark. I do not object to tolerable growth of horn, which shows constitution. The neck should be rather long to secure carriage and length of carcass, merging in those curved lines of beauty into a well-developed prominent bosom. The chest, necessarily capacious to give ample room for heart and lungs, should approach the oval of the well-bred horse, rather than the round or square proportions of the cart-horse. This will bring the dewlap somewhat near the ground. The shoulder blades will be well laid back; there will be no roughness or overdue prominence of the shoulder points. In a young, growing animal in moderate condition this conformation will entail a somewhat light appearance of the fore quarters and the fore chine may not be so abundantly clothed with beef as the butcher would desire. The back and loin cannot be too wide, the back ribs should be well sprung; the narrow weak-backed bull is certain to have the worst of all faults, a delicate constitution. The quarters should be long, well-clothed with lean meat, but alike in bulls and cows of milking proclivities, they will not be so thick and massive as in animals selected more exclusively for beef making. The body will be invested with a skin of moderate thickness, soft and pliant, not papery, and covered with rather long fine hair. The soft undergrowth of mossy hair, so pleasant to handle, augurs fattening rather than milking capabilities. It is not absolutely necessary for ordinary dairy herds that the bull should have a long, fashionable, or even perfectly consistent pedigree, free of the so-called alloy, and satisfying the taste of the critical purist. But a good sound pedigree secures uniform, certain results. A bull whose pedigree is made up of a number of dissimilar strains is unlikely to get his calves with that uniformity of good type which is so desirable. The fashion of the present day is to use young bulls, beginning with them when they are about 15 months, and discarding them often when they are 3 years old; frequently they are slaughtered before their stock becomes appreciated. In olden times bulls were wont to be used charily at first, their progeny were carefully noticed, and a successful sire was used so long as he continued serviceable.

I recently visited the Berkely herd of Lord Fitzhardinge, which is somewhat famous from the fact of his having given £4,500 for the celebrated bull, Duke of Connaught, which I judged to weigh as I saw him well on for $2\frac{1}{2}$ tons. The herd is bred for sale and beef, but in the district, a famous dairy one, were numbers of grand Dairy Shorthorns. Here, as at Lord Ducie's, near at hand, the Shorthorns are all pedigree beasts, and extremely hardy, and certainly not highly fed. To prevent quarter evil, setons are let in below the brisket. The Vale of Berkely is near the Severn, and exposed to southwest gales, which are here very severe.

Dairy Shorthorns.—The following will give some idea of the value of what is known in the midland counties of England as the Dairy Shorthorn, for its milking properties. There are some families of this old

only essential that the desired milk-own persons some. Size, substance, and vigor. Close-ting on account of of steers or dairy eifer-like or steery-ould be kindly, free r, without which a to tolerable growth d be rather long to ose curved lines of e chest, necessarily ould approach the or square propor- somewhat near the k; there will be no oints. In a young, nation will entail a t the fore chine may lder would desider- ack ribs should be n to have the worst should be long, well- of milking proclivi- mals selected more ested with a skin of covered with rather o pleasant to handle, It is not absolutely ould have a long, free of the so-called

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idea of the value of as the Dairy Short- families of this old

race which are famous for their symmetry and meat-producing quali- ties; others are equally famous for their milk, and in some cases, where the owner of a herd has made it his study for a number of years to breed from milkers only and to produce as large a yield as he possibly can, the herd has become marvelously prominent in this qualification, as in the case of the one to which reference is made below. A year or two ago a member of the British Farmers' Association offered a chal- lenge cup for the best dairy-farm record, and although records have been sent in by farmers and land-owners in different parts of the coun- try, and with regard to different breeds, so far none have equaled that which was sent in by the Earl of Warwick during the past year (1883), although, unfortunately, from a technical error it was not able to com- pete for the prize.

Wonderful Shorthorn dairy record.—The steward, Mr. Tough, com- mences his record with a statement as to the analytical value of his milk. On June 2 it was tested by Mr. Bostock Hill, the county analyst, and was as follows: solids, 9.09; fat, 4.37; total, 13.46. It was again tested June 29, showing an increase of .21 per cent., while the fats re- mained *in statu quo*: solids, 9.31; fat, 4.36; total, 13.67. On August 4 the solids showed a considerable falling off, while the fats were propor- tionately increased: solids, 9.12; fat, 5.21; total, 14.33.

The Society of Analysts have adopted 9 per cent. as the limit for solids not fat, while Professor Wanklyn suggested 9.5, the limit for total solids being 11.5.

The record refers to the Shorthorn cows, four of which were four years old, four five years old, and two six years:

Number—	Weight on May 1		Weight August 27 after summer feeding.		Net gain between May 1 and August 27.		Product in milk for one week on May 1.		Product in milk for one week on August 27.		Average daily product for week of May 1.		Product for the seven-teen weeks.		Average daily product for those sixteen weeks.		Percentage of cream per cow on August 27.		Milk set for butter.					
	Stone.	Stone.	Stone.	Stone.	Stone.	Stone.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Qts.	Quantity of milk.	Yield in cream.	Product in bot-ter.	ter.		
1.....	78	92	14	157	112	22	112	22	2,312	19	11	836	78	392	19	11	836	78	392	78	392	78	392	
2.....	88	94	6	154	118	22	118	22	2,328	19	10	508	70	44	10	508	70	44	508	70	44	508	70	44
3.....	84	94	10	173	143	24	143	24	2,838	23	10	649	93	55	10	649	93	55	649	93	55	649	93	55
4.....	88	92	4	126	136	18	136	18	2,426	20	14	571	99	54	14	571	99	54	571	99	54	571	99	54
5.....	80	96	16	143	110	20	110	20	2,137	18	12	470	75	40	12	470	75	40	470	75	40	470	75	40
6.....	80	80	0	110	150	21	150	21	2,737	23	11	640	88	51	11	640	88	51	640	88	51	640	88	51
7.....	86	96	10	133	110	19	110	19	2,227	19	13	509	83	44	13	509	83	44	509	83	44	509	83	44
8.....	80	92	12	130	104	18	104	18	2,048	17	12	469	76	39	12	469	76	39	469	76	39	469	76	39
9.....	78	94	16	136	120	19	120	19	2,262	19	10	524	77	42	10	524	77	42	524	77	42	524	77	42
10.....	90	100	10	138	114	19	114	19	2,214	18	10	491	74	40	10	491	74	40	491	74	40	491	74	40

* Only one cow maintained her position.

† The highest yield was of a five-year old cow, calved April 2, which gave in twelve weeks 173, 157, 174, 198, 185, 184, 183, 170, 178, 177, 162, 158, or 25 quarts a day for 84 days.

‡ The average is below 1½ for the lot, which is a distinct refutation of the value of the Shorthorn as a butter cow.

§ An average of 708, a decidedly disappointing quantity.

¶ A total of 4534 pounds from 13,701 pounds of milk, or about 1,030 gallons of cream and showing an average of butter to milk of about 3.20, and cream 41.98. The quantities of skim milk are also shown, and bear a fair proportion to the quantities of new milk used.

It appears that the milk was in part sold and partly set for cream and churned. The quantity sold was so large that the cows yielded, per cow, from this source alone for the seventeen weeks of the trial from £13 to £18 5s., No. 3, the big milker, claiming the latter high figure, which is marvelous even without the sum to her credit for butter ann

skim milk; and if it were possible to collect dairies of such cows, either one of two things would happen—the compilation of fortunes the general reduction of foreign dairy imports—perhaps, both. Assuming from the yield shown by No. 3 and the return she made that the milk produced 8d. a gallon, this would be a decidedly good summer price.

A new feature in this record is the manure, which appears to have been well looked after, and very properly so, especially since, as is seen below, the cows had a considerable quantity of cake. The feeding was—

Food.	Pounds.	Value.
Bean flour	106	£. s. d. 16 4
Cotton cake	259	13 2
Palin-nut cake	259	14 0
Grass	19,180	4 19 8
Hay	99	1 7
Straw	748	19 10

Labor is charged 28s. 3d. per cow, and haulage 9s. 11d., making a total of £10 2s. 9d. per cow; or, when considering the valuation of each animal—for they were valued both at the beginning and end of the trial—an average of £10 14s. 1d., the real figures running from £9 4½d. in one case to £14 15s. 2d. in another.

Since writing the above we have felt it necessary to again examine Mr. Tough's record, the yield of milk being so surprising. It will be remembered that Lord Braybrooke's cows gave an average of about 2,100 quarts for the year, and yet, as shown above, Lord Warwick's in every case gave more than this for the seventeen weeks. Lord Braybrooke's, again, averaged 5 quarts to 10 quarts a day for the period in milk (not the year), while Lord Warwick's gave, as shown above, from 17 to 23½ quarts for the seventeen weeks. With all respect, and we are bound to take Mr. Tough's figures, we consider his record, if not so elaborate as a matter of figures, yet one infinitely more worthy of a challenge cup than any other, for his herd is a truly marvelous one, and will take our American friends all their time to rival.

There are 10 cows averaging 19.77 quarts per day for seventeen entire weeks, one actually reaching 23.84 quarts. This cow returned:

For milk sold (2,189 quarts)	£18 4 10
Butter (56½ pounds)	3 9 3
Skim-milk (581 quarts)	2 8 5
Manure	0 15 5
Total return for seventeen weeks	24 17 11

Let us see what has been done in the milking competitions as a guide to the value of this return. At the 1880 trials the highest Jersey or Guernsey yield was 38 pounds 5½ ounces; the highest Shorthorn, 50 pounds 5 ounces; the highest Dutch and cross-bred, 43 pounds 12 ounces, and we think we are right in believing that neither at the 1881 nor the 1882 trials were the highest of these figures exceeded. At all events here are cows winning in milking trials which give less in their flush for a single day than Lord Warwick's best average for 119 days. Facts speak for themselves, and it appears to us that Lord Warwick's can not only beat any herd of which the public has lately been informed, but that he would stand the greatest possible chance of carrying off the chief milking trials.

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A remarkable herd of dairy Shorthorns.—The following particulars refer to Mr. Hutchinson's herd, well known as a famous one in York-shire, and it will be the more valuable, inasmuch as he was the winner of the royal prize for the best farm in 1883. The farm comprises about 250 acres, of which over 100 are grass. The soil is partly on gravel, and the rest on strong clay loam, with bowlder stones. This latter is only moderate, and without liberal treatment would not be very productive. The present tenant on succeeding to the farm inherited a small herd of unregistered Shorthorns, which, with one or two purchases and the use of Warlabby and Killerby bulls, has resulted in a collection of cattle that have won more prizes since they have been shown than any other herd of similar dimensions. The most fortunate investment was Gerty, by Vainhope, bought for 42 guineas when in calf to Knight of the Shire. Gerty had 8 heifer calves, twins twice running, and from her descended Gertrude, Gratitude, Grateful, Gratification, Gratulations, Gratuitions, Gratia, and Glad Tidings.

Another equally remarkable family are the Lady tribe, which we believe were bred by Mr. Hutchinson's father. Of this sort were Lady Playful and Lady Alicia, winners at Taunton and Birmingham, and Lady Pamela, the champion female at the York meeting in July, 1883, a wonderfully true-grown and heavy-fleshed two-year-old, which was first shown as a yearling at Reading in 1883 in a big class. At the last five Royal meetings Mr. Hutchinson has secured five first and three second prizes as well as three champion prizes. This is a record which it would be hard to beat. Lady Pamela is wonderfully thick-fleshed and true-grown, with great ribs and thighs, both upper and under lines perfect. She has won 21 first prizes and has only twice been beaten. Lady Pamela 2d, own sister, a rich roan calf with great length, is also very promising and likely to make a prize-winner, whilst Lady Gratia deserves high commendation. Glad Tidings, another of Gerty's descendants, a handsome three-year-old, was put second at York to Mr. St. John Acker's Lady Caren 9th, both being very good ones.

In the pastures are to be found a lot of lusty cattle of generally uniform type, the best being a fine old cow, Lady Playful (the winner of fifty prizes); a long level white cow, Gratification; Lady Gracious, by British Lion out of Lady Grace, by K. C. B., a handsome red cow with quality and substance; and a fine old wreck, Lady Laura, which had won for her owner £800 in prizes. The bull in service was a two-year-old, bred by Mr. Talbot Crosbie, out of Riby Marchioness, which was quite a useful animal, with great length and substance. On the farm, in addition to many other animals, were 29 cows, 13 heifers, 10 bull calves, 10 heifer calves, and 1 bull, the whole showing that it was heavily stocked, and indicating also the high condition and large produce obtained from the land.

Treatment of dairy Shorthorns on a model farm.—Mr. Turnbull, of Hull, is another winner of a first prize at the Royal, and, as a very large dairy farmer, occupying as he does more than one farm, and keeping and breeding Shorthorns, we give the following particulars respecting his system. In 1881-82 no less than 120 acres of Mr. Turnbull's Twyer's Wood Farm had been drained at 2 feet deep, the landlord finding 3-inch pipes, and the tenant leading and putting in the same. Deep draining does not answer on the Holderness clay, though a depth of from 30 to 36 inches might have been preferred. Over 90 acres have been limed with 5 tons of magnesian lime per acre, which has proved of the greatest advantage in securing healthy roots and improving the quality and yield of grain, whereas as compost with road-scrappings the

effect in improving the herbage, and especially in developing the clover plants, has been very marked. The land is generally a strong loam, of a fertile character.

The stock on the farm comprised 40 cows and heifers, principally Short-horns, of excellent type and grand milking properties, some cross-bred Ayrshire and Shorthorns, 10 capital two-year-old steers, and a very useful two-year-old bull, selected with due regard to the milking properties of the dam. Although the grass is of excellent quality, it is supplemented with cake. Thus, from May 1 to October 21, the cattle, according to age, have from $2\frac{1}{2}$ pounds to 7 pounds of cake daily (two-thirds cotton and one-third linseed cake).

They live out day and night, except at milking time (4 a.m. to 6 a.m., and from 2 p.m. to 3.30 p.m.). From July the dairy cattle have a daily allowance of green tares, and in September and October they have cabbages in addition to cake and grass. The heifers in calf run out on grass both summer and winter, but are housed in a straw yard at night in winter, when they are supplied with from 14 pounds to 21 pounds of hay, according to age and size. Heifers due to calve in the spring are allowed about $2\frac{1}{2}$ pounds of linseed cake daily for two months before calving. From October 21 to April 30 the cows are allowed from 21 pounds to 28 pounds of hay (one-third long and two-thirds chaffed), with pulped roots, the quantity of the latter ranging, according to the size and condition of the animals, from 36 pounds to 84 pounds, the artificial food for cows in full milk comprising 3 pounds of linseed cake and $3\frac{1}{2}$ pounds to 7 pounds of crushed oats. Heifers in full milk are fed with about 21 pounds of hay (two-thirds as chaff), with 56 pounds of pulped roots, and 5 pounds of linseed and cotton cake, in equal proportions, or a similar weight of linseed cake and crushed oats. Oat straw when well got is substituted for a portion of the hay. Mr. Turnbull considers that 10 pounds of oat straw are equal to 7 pounds of hay.

The grass farm of 140 acres at East Park, which Mr. Turnbull holds, is occupied on a lease for five years from April, 1880, and has received very liberal treatment for so short a term, as it includes boning a considerable part of the pasture, the liberal application of fold yard manure, both to grazing and mowing lands—71 acres being devoted to meadow on which was an excellent crop of hay—and the erection of a considerable length of strong posts and rails, which cost about 1s. 6d. a yard fixed. The buildings comprise the larger portion of the hall-stables and outhouses, and by judicious alterations have been rendered very convenient for breeding and rearing stock, which is the main business here.

The management of young stock is admirable, some details of which we will give. As to the treatment of the calf: It is removed at birth; new milk is supplied for a month, during which period it is kept warm in pen; next, for three or four weeks, boiled skim-milk is given; and, to prevent the milk being burnt, the copper vessel is suspended in a copper of water; then one-third boiled linseed and two-thirds oatmeal, commencing with 1 pound of the mixture daily, are mixed hot with skimmed milk. All this time the calf is taught to eat sweet hay and a little linseed cake, and with each change of food the calves are removed to more airy quarters, which also allow of more exercise. In the spring and summer of the first year the calves do not go out; the winter calves are run on grass, and have a capital shed to shelter in at night. The great secret of success is the judicious change of food and quarters, according to the age and strength of the animal, by which steady progress is insured, the cake being continued. The heifers run

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out in summer and winter, coming into a well-sheltered yard at night in winter. They calve down at two years of age, and remain at the farm till they reach their prime, *i. e.*, coming down with third calf, when they are sent to the before-mentioned farm. The stock in August, 1883, consisted of 31 cows and heifers, in milk or about to calve; 18 yearling heifers, fifteen to twenty-one months old, for calving the following spring; 19 winter calves, mixed, eight to ten months old; 10 Shorthorn calves, three to six months old; 13 Shorthorn calves, under three months; and 1 yearling bull.

The winter's average yield of milk was, at the first-mentioned farm, where the animals in most profit are kept, about 9 quarts, and at the latter about 7 quarts, giving an average of 8 quarts. In summer the result was higher, viz, 11 quarts and 10 quarts respectively, giving an average of 10½ quarts. Assuming that the average is 9 quarts a day for nine months in the year, we have, at 10 pence a gallon, a gross return per cow of over £25, which for the liberal mode of feeding pays well. East Park is well sheltered by plantations, clumps of trees, and fine spreading timber.

Letting out cows to laborers.—One other branch of Mr. Turnbull's enterprise must be noted, which has been pursued since 1876, and this is the letting out of cows to laborers. The experiment was commenced with Kerry cows, of whose valuable dairy properties Mr. Turnbull had satisfied himself during a visit to Killarney. These were succeeded by Ayrshires. The rate of hire is regulated by the cost of the cow, one-fourth of the cost being the average rate obtained. The cows are supplied when near calving. The contract is for a year, and the money is paid in advance, a plan which insures due care of the cow, as, although the loss of the animal is borne by the owner, the loss of produce falls on the hirer. As an evidence of the care that is taken of the animals, Mr. Turnbull states that, having let out 150 cows in the seven years of this business, only one cow was lost in calving, and the first animal let is still in service. The opportunity of getting the calf and the produce on such terms has been largely appreciated. Mr. Turnbull estimates the annual cost of keeping an Ayrshire cow on these conditions as follows: Hire, £5; summer keep, £5; winter keep, £8 10s; total £18 10s. A fairly good cow is considered to yield 2,200 quarts. Taking this at 3d. per quart, and the calf at 20s., though the present value if by a Shorthorn bull would be more than double that sum, the value of produce is £28 10s., leaving a profit of £10, besides the great advantage of skim-milk for the children. After having been continued for three years the experiment was found to give a return of 5 per cent. interest on the capital invested, after paying all expenses of agency, and allowing for depreciation, fall of price, &c. The hiring commences with heifers about calving time, these being let at from 10s. to 20s. under the ordinary price, and frequently retained by the same hirer for some years.

(4) THE DEVON CATTLE.

The Devon cattle, as we find them now, are very different no doubt to what they were many years ago, but there is very little question that, even in their latter-day aspect, they exhibit many of the particular features, and, to a very large extent, much of the form which characterized the members of the aboriginal breed from which they sprang. They have been called into existence to fulfill a particular and in some respects peculiar purpose, and, as far as it is given to us to judge, they are not to be found wanting. The localities in which the breed is most

common, the climate to which it is exposed, and the requirements of the men who profit by it always combine toward a certain end, and in the Devon cattle these influences have worked together with a most satisfactory result.

Points of Devons.—Devon cattle possess a distinctive type, but several varieties are placed under the title, and there is probably no breed in which individuals of almost precisely similar general aspect will, when scrutinized and analyzed carefully in their several features, exhibit more marked variations. In size they are medium, although it is much the custom to speak of "the little Devons." True, they do not possess the bulkiness of the Shorthorn or the Hereford; but, for all that, they are far from being a diminutive breed like the Ayrshires, the Kerries, or the Channel Isles cattle. The general aspect of the Devons is graceful, and their appearance seems to betoken a gentleness of mien which their looks do not belie. The head is small but the forehead comparatively broad, tapering off to a neat, clean-cut muzzle. The ears are thin and soft in texture, the eyes bright, and do not exemplify that dreamy look which many breeds have. They should be encircled by a ring of light coloring, almost approaching an orange hue. The nose should be white. The horns are of medium length, graceful, and spread in an outward and upward direction, tapering easily off. In the male this feature is scarcely exemplified to the extent that it is in the female.

The outline of the Devon should not exhibit any very marked divergence from the shape of the proverbial parallelogram which should be realized in fat beasts. The neck is full but lengthy, and should show a good wedge-like form when regarded end on. The chest is deep and prominent; wide, fat loins, and a well-filled rump, where plenty of beef may be piled up, constitute one of its best points as a butcher's beast. The legs are fine, but well set on. The bone of the Devon is small, but the frame is, notwithstanding, comparatively speaking, large. Red is the color of the Devon, although a large number of the cattle in Devonshire display some white about them. The skin is fine and mottled.

Varieties of Devons.—Devon cattle may be grouped under three varieties, the North Devons, the South Hams, and the Devon proper, as exemplified in the accompanying illustration. The North Devons are the smaller and finer variety. Their coat is softer and more curly, and their general appearance more nearly warrants them being termed "the little Devons" than does either of the other two more distinctive varieties. The South Hams cattle—that is the cattle bred upon the fine uplands which lie between Dorset on the southeast, the sea on the south, and Cornwall on the southwest of Dartmoor, which forms the center highland of the county—are fine beasts, coarser in appearance and of bigger bulk than the North Devons. The Devons proper may be said to combine the most notable features of these two varieties. They are found mostly in the district around Taunton, and in Somersetshire and in Dorset, and are well represented, as a rule, at the Smithfield Club's show, where they are apparently the embodiment of the standard of excellence for Devons. Besides these, both Exmoor and Dartmoor, the latter particularly, can show a rougher type, smaller in size, and rather coarser in bone and flesh than can the other less exposed parts of the country.

Special characteristics.—The merits of the Devon are many. They are as profitable a meat-producing breed as any we have. Given so much food, the percentage of beef returned is as large as can be shown by any other breed. The beef is of prime quality, the offal proportionate, and the bone small. As fatteners they are not to be surpassed in their own

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Johns Brien & Co. Lith.

MR W. FARTHING'S DEVON COW "PRETTY FACE"

country, and will go from store to fat be its quickly on good pasture and a little artificial food. They require no severely expensive nor extensive course of fattening. As dairy cows they are more noted for the quality than the quantity of their produce, but it must not be supposed that the latter is small. As a rule, seeing the cream that is got from their milk, the quantity is comparatively large. One hears of great Jersey and Ayrshire records, but there is little doubt that were Devon records as persistently and carefully put before the public, they would take a high place in the ranks of our dairy breeds.

The illustration represents Mr. Farthing's cow Pretty Face, and gives a very good idea of the Devon in its proper form. The head is not quite what it should be. The horns project in too straightforward a direction and appear too parallel. But the neck is well shown, and the fineness of the frame, with, at the same time, medium, heavy build of buttock, is also evident.

Mr. Perry, of Alder, Lewdown, North Devon, says:

I will not confine my remarks to strict data, but rest them rather on general natural laws and principles and broad results, because from the various and varying conditions which must be brought into play to produce the developed animal arising from different treatments and situations, strict or narrow data are often misleading rather than otherwise. In the first place, I hold that small as well as large sized animals are needed to turn our various cattle foods to the best account for the production of the best supply of animal food for the people. All producers cannot raise the foods required for the proper development of large-sized animals, nor are large-sized joints of meat suitable to all households. Again, small animals can be brought to perfection on pastures which will only keep large animals in store condition, and when fodder is scarce the small animals will pick their food in sufficient quantities, while the large animals will starve, and, if wanted for the market, the former can, in a few weeks, be fattened on concentrated foods before one's eyes, whereas a large animal must have its time. There is this, however, to be said of large-class animals: if their owners can keep them fattening from birth, they must, to have heavy weights at an early age, have growth.

My conclusion is that an animal which is right in form, quality, and constitution is a first-class one, whether it be of a large or small size, and it therefore remains for those who have them to place them in suitable situations for foods and markets. I have often found my small-framed animals make me the most money, and my motto is to have an animal that will *swell* rather than grow into value. From fifty to sixty years ago Shorthorn cattle were introduced into Cornwall by a Mr. Peter, and they spread over a large part of the country, fixing themselves more particularly in the best districts. They also found their way into Devonshire and Somersetshire, where they have had rather an extensive hold, but of late, however, the Devons have been hedging them rather closely into the most fertile spots of the country, and many who were zealous advocates for them have either partially or wholly given them up. Herefords also found their way into Cornwall about the same time and were extensively kept in the eastern part of that county by a few other breeders farther west, but they have nearly disappeared from the east and are in few hands in the west of the county. They are no favorites with the butcher, having too much rank spine or fat, and killing hollow and deceptive in weights. The North Devons are now entering into the strongholds of the above breeds, and becoming the most general breed in the west of England. Their flesh is more marbled and mixed than the before-mentioned breeds, and their meat, as a rule, is of finer texture, more firm, and of superior flavor. They may be divided into two classes, the North Devon and the Somerset Devon. The former is a smaller animal than the latter, more handsome, and more easily fattened. They are particularly adapted for hilly districts, where they will frisk about with pleasure, and do well on short pastures, and, with a little indulgence for a few weeks, will be fit for the butcher, nothing in the way of beef selling at a higher price per pound. Animals of this breed that are fit for slaughtering at 5 cwt. may be made 8 cwt. or 9 cwt. with extra feeding.

The Somerset Devon is a larger animal than the genuine North Devon, and from having been crossed with the latter sometimes grand animals are produced. As a specimen; for example, I may name Kidner's Islington champion prize ox. It is certainly important that the North Devon should be preserved, for then crosses may be taken as people wish, but if the pure race is lost it cannot be recalled and a cross-bred animal cannot be depended on to stamp its character on its offspring. The well-bred Devon is not, as a rule, a great milker, but the quality of the milk is rich and a pound of butter per day may be considered a good average. Well-bred animals are often

MR W. FARTHING'S DEVON COW "PRETTY FACE"

kept in the dairy, though they fall as milkers, simply on account of their value as breeders, but this is not the case with mongrels, for if they fall as milkers they are at once fattened. On this account mongrels are often stated to be better for the dairy than they really are. The Devon breed occupies, with but little exception, the whole of the district north of the forest of Dartmoor to the Bristol Channel, including the forest of Exmoor, and from West Somersetshire through Devonshire and Cornwall it holds the principal sway. I consider the fact of the Devon cattle again taking possession of the strongholds of the other breeds to be a broader and much more trustworthy fact as to merit than any test made (as I have before hinted) on a small scale. The Devons were first bred on the Government prison farm at Dartmoor, then the Ayrshires, then the Polled Scots, and now the Devons have again taken up the position they at first held.

Mr. Richard Bickle, of Bradstone, says:

My uncle has been a breeder of Devons for upwards of forty years and I still retain the same herd. I have always found them more profitable than any other breed, both for milk and aptitude to fatten. I can keep three Devons to two Shorthorns, and I find they will stand the winter and our wet climate far better than any cross or other pure-bred animals, and that without any housing or extra care. I have 125 bullocks, chiefly Devons, but I find the best bred ones are preferable to be kept, as they are always fit for anyone to look at. During the summer months I graze upwards of 100 besides my regular stock, and consequently I sometimes get a Shorthorn, Hereford, or cross-bred animal, but I invariably find it does me no good.

I have never tested the milking properties of the Devons, but they are not heavy milkers as a rule, although the cream is of the richest quality and will make more butter than that from almost any other breed. We never make cheese in our county, as it is not one for cheese making. The average weight of my cows with ordinary feeding would be about 7 cwt. of marketable beef, steers being about the same at 3 years of age. I have had some of the latter which weighed as much as 13 cwt. at 4 years old. Bulls in proportion weigh just the same.

The chief part of my farm is a light soil, with grey freestone, and the temperature is very changeable both in summer and winter. We have plenty of rain. As the district I live in is a grazing district the grasses used are of an ordinary character just for three years ley. The Devons in my immediate neighborhood are not used for draught purposes, but in the neighboring county of Cornwall I have heard of several being so used. My uncle had oxen in constant work many years ago, and they were considered better workers than any other breed. My young stock as a rule are housed about the beginning of November, but it depends partly on the mildness of the season. Store ones have an open shed all the winter.

Mr. Surridge, another breeder of the Devons, observes:

In speaking of the Devons it must be remembered that there are the Somerset Devon and North Devon breed. I have been breeding principally Somerset Devons. I have never kept an account of the average yield of milk, but some of the Devon cows give from 16 to 18 quarts per day and make from 1 pound to 1½ pounds of butter daily, and others give not more than half that quantity. The live weight of a Somerset Devon at four years of age reaches from 18 cwt. to 22 cwt., and my own bred bull Robin at 4 years old weighed 1 ton 56 pounds, and the dead weight was considered 80 score. The cows weigh from 12 cwt. to 17 cwt., live weight; oxen, from 15 cwt. to 20 cwt.; steers under two years old, 8 cwt. to 10 cwt.; steer under three years old, from 12 to 15 cwt., and steer under four years, from 13 to 17 cwt.

The grasses cultivated are Dutch, Alsike, Trefoil, Italian, rye and clover. I myself cut some for hay; others cut some green for feeding in summer. If the animals are intended for exhibiting the system of housing pursued is to keep them in in summer and winter, giving them every day moderate exercise, and feeding them on different kinds of meal-cake root and green food. I commence handling and leading when my beasts are about three months old, but sometimes before. The dead weight of one of my animals (Norah 3d) was 144 stone 5 pounds, or 57 score 17 pounds, and her live weight 14 cwt. 1 quarter. The temperature on my farm is about 60° to 65° in summer and 45° to 50° in winter, and the soil in my neighborhood is chiefly ray and sand, some of which is very good and some very inferior.

(5) THE HEREFORD CATTLE.

Characteristics.—The chief points to be looked for in a good Hereford are, first, that the color should be a distinct red, not too dark or too light, white face, mane, breast, and belly, white end to tail, and white legs as far as the knee and hock, sometimes running up the flank.

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MRS. EDWARDES' HEREFORD HEIFER 'LEONORA'





HEREFORD OX.

The bull should have a good masculine head, not too long, broad between the eyes, which latter should be large and prominent, but with a mild look about them, denoting docility and equability of temper; the horns should be of moderate length, springing straight from the head. The cow's head should be much the same, but finer, should have a mane, and her horns turn upward slightly; they should be in both cases of a foxy white, although occasionally they are found tipped with black. The nose should be a pure white or flesh-color. The bull should have a good rise of crest, deep-sloping shoulders, well-developed brisket, straight back and belly line, wide loin, good springing ribs, moderately broad hips, tail well set on and falling in a plumb line to the hocks; the hind quarters should be long from the hip back; the thighs, which are a very important point, should be large and full, showing plenty of width across when you stand behind, and should be well meated to the hocks. The whole carcass should be set square on good short legs standing well apart, and be covered with firm flesh of good quality, and a mellow hide of soft but not too fine hair, giving the impression, when you touch it, that it will stretch to any extent; but the test of "touch" is extremely difficult to explain in words, and it can only be learned by practice.

History of the Hereford.—There can be no two opinions on the question of what Hereford cattle are; they are most undoubtedly a distinct and pure breed of great antiquity. Their early history is like that of many others, rather shrouded in mystery, but it is generally allowed that there has been a breed of cattle, red and mostly with white face and markings, for at least two hundred years in the county of Hereford and the neighboring counties. When crossed with other breeds the potency of the Hereford blood (pure for centuries) is distinctly proved, as it is an exception for any calves to come any other color than the red with white face. This has come true from Hereford bulls on black Welch cattle, Ayrshire, and Shorthorns; again, if a Shorthorn bull is put to a Hereford cow the produce usually follows the dam in color, and cases have been seen where the produce of the Hereford bull with the black cattle come black, but still they have had the correct Hereford marking as regards the white face and legs.

Valuable qualities of the Herefords.—Their milking properties have been so long neglected in the interest of beef, that they are usually not deep milkers, but give very rich milk. In all cases a cow should be milked regularly and stripped quite clean. No doubt this has much to do in forming good milking tribes of cattle, by encouraging the milk-giving organs as far as possible. Where calves are allowed to suck in the open field this cannot be attained, and is one great cause of the Herefords not giving so much milk as they would under other circumstances. As beef makers they are quite at the top of the market, as market quotations record best Scot and Herefords as being usually quoted together. The calves are usually allowed to run with their dams during the summer, and this gives them a good start, but it is too often lost sight of that they should be kept growing on when weaned, instead of stunted during the winter and following months.

The Hereford fairs have long been noted for bringing together the best collection of bullocks in England, and are attended by dealers and grazers from far and wide, as they are highly valued in our great grazing districts.

Breeders of Herefords claim for their favorites that they are among the most hardy of all breeds of cattle, can be fed on less meat, and thrive on the roughest food, and thus are particularly adapted for countries

where it is impossible to take special care of the cattle through bad seasons and winter months.

Herefords, except in a few instances, have been bred entirely for beef. One great object of breeders is to have their animals as wide on their chine as possible, so as to carry good full crops when fat, and no cow will milk deeply unless it is made like a wedge—the lighter neck and forepart the better. If attention were paid to the Hereford as it has been to the Shorthorn, they could be trained to milk well and deeply, and the richness of the milk is not gainsaid; but whether they would excel the Shorthorns or become equal to the best of them it is difficult to say, nor do I think it worth while for breeders to try; at all events so thinks another Hereford man. They stand first and foremost as a beef-producing race, and perhaps it is as well they should for the present take their stand on that, but if any breeders fancy taking up the milk line, they will probably in a great measure succeed.

Herefords for crossing.—A celebrated breeder of Herefords in England recently addressed the following queries to a gentleman who had tried the cross of a Hereford bull on Shorthorn dairy cows for several years:

1. Of calves got by a Shorthorn bull or by a Hereford bull, which fatten the quickest and which are the most valuable if sold fat to butcher? 2. Of heifers got by a Shorthorn or Hereford bull, which do you consider the best for milk, having regard both to quantity and quality, and in quality both as regards cheese and butter? 3. As to the produce generally got by a Shorthorn or Hereford bull, do you find any difference as to their gain of flesh or ability to thrive both at grass and in yards; and, if so, state fully your views thereon? 4. Do you find any difference of size in the produce; and, if so, which are the largest animals—the Shorthorns or those the result of the cross with the Hereford bulls? 5. Do you think there is any difference as to hardness or as to liability to disease between the Shorthorns and the animals resulting from the cross with the Hereford bull; and, if so, to which do you give the preference? 6. Does the offspring of the cross with a Hereford bull generally follow the marking of the sire or of the Shorthorn dam?

The following were the replies received:

1. I consider those got by a Hereford bull. 2. Heifers got by a Hereford bull are, I consider, equal to the pure-bred Shorthorn for the production of milk, both as regards quantity and quality. 3. My experience tells me that produce got by a Hereford bull out of a Shorthorn cow feeds quicker both on grass and when put up to feed. 4. Produce obtained by the cross, as mentioned in No. 3 (viz. by a Hereford bull), is the larger of the two. 5. Undoubtedly the produce obtained by using the Hereford bull is the hardier and has my preference. 6. I find that the offspring obtained by the cross with the Hereford bull follows the sire in color in five cases out of seven.

The writer adds as follows:

Having some three years ago bought some Hereford cattle from you, I think you might like to know that they have done remarkably well, though I find it takes a long time to make a name as a Hereford breeder. At the same time that I bought the Herefords from you I purchased ten Yorkshire dairy cows—Shorthorns—from Mr. Gothorp, near Bedale, in Yorkshire, and after these cows had calved I determined to try a cross of the two breeds, which I did by using the Hereford bull I bought from you on the Shorthorn cows. The result was beyond my expectation. I reared the calves on skim-milk, &c.; they had a little cake till they were six months old, when they took their rack. At eighteen months old I gave them 4 pounds each per day when grazing (this would be in September). On the 12th October I put them up to feed, giving them 8 pounds of cotton-cake and linseed-cake mixed, and 6 pounds of meal with pulp each per day. The week before Christmas I sold two of them, averaging £21 10s. each, and also some Shorthorn bullocks (which I had also bought from Mr. Gothorp). These latter were three months older, and only realized £19 15s. per head, though similarly fed. In the second week of January I sold some more of the cross-bred bullocks (they were then twenty-three months old), and they averaged £24 5s. 6d. per head, and the remaining Shorthorn bullocks averaged £22 17s. per head, being, as the others, three months older. I certainly am of opinion that the bullock obtained by this cross is better than the pure-bred Shorthorn for the quick production of beef. I have also some heifers of this cross about to calve, and they carry plenty of flesh, and promise to make equally as good milkers as their dams. I consider the result of the cross satisfactory, especially on this poor, cold clay soil, the grass of which (as you know) will not feed a mouse.

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As to their milking qualities, says a tenant farmer, no doubt breeders have neglected them almost entirely, as it is the usual custom to rear the calves on the cows, and beef, not dairy produce, is, as a rule, the end aimed at. This is, however, true in a great degree of other breeds when the best tribes are kept for breeding purposes, and it is a question whether a Hereford does not give as much milk, and perhaps even of a richer quality, than the crack tribes of other breeds, excepting those bred especially for milking purposes. There are few Hereford dairies kept, but from my own experience I believe, by selection, that a grand milking herd could soon be established. No one will, who has tried the experiment, agree to the statement that the Herefords do not cross well with other breeds. The Americans have found it out, and now assert that they can sell their Hereford grade steers for more money than those of other crosses. It may be true that they have not been very extensively tried, but the experiments that have been tried will soon "get wind"; in fact they have already, and the demand is entirely increasing in consequence.

One great proof of the Hereford being a pure and distinct race is that, although crossed with whatever breed may be desired, the true Hereford marking is sure to show itself; and if an animal has only a quarter strain of blood, the Hereford marking is still there. The great object in America now is to improve the cattle as beef producers, and to put the good roasting pieces on the narrow-chined, bad-backed cattle of the plains; this they believe, and rightly too, the cross with the Hereford will do. Another great point in favor of the cross is the power of the Hereford to endure knocking about and rough usage better than more delicate cattle, and this is of the very greatest importance when considering the vast distances the cattle have to travel through America, and by sea, before they reach this country as beef.

A recent purchaser of a large herd of Herefords in this country writes that they had a very rough passage out, and the hatches had to be all battered down, but he had no losses, and all arrived in capital condition, none the worse for their knocking about. He could only account for this from the fact that this breed of cattle could stand such usage better than others or he should have had serious loss. As to their not feeding so well in stalls or attaining such great weights there is proof from many trials, and from Smithfield statistics, that they are little behind, if not equal to any other known breed of cattle.

Says another authority:

The Shorthorn has no quality superior to that which the Hereford possesses; if it has, let it be fairly shown. Take each point in order: Both breeds have been well tried, both as graziers and feeders. It is acknowledged that the Hereford is the best on the same meat as three Shorthorns. There is evidence to show that the milking quality of the Hereford is as good as the high-class Shorthorn, and their milk is much richer. The London market bears testimony to the superiority of the Hereford meat by always quoting it in advance of the Shorthorn. Their early maturity and breed. The merit of the Hereford for crossing purposes has been disputed, but now it is an indisputable fact that they are fast gaining ground in the good opinion of graziers. A great many bulls are now sold to dairy farmers to cross with their Short-horn cows, as they say they can get their calves ready so much more quickly for the butcher, and if kept on for bullocks they beat the ordinary run of Shorthorns in aptitude to fatten and in quality. To mention a few instances: Eight Hereford grade steers were put up to feed, and sixty Shorthorn grades were picked out of a six hundred lot, and then the best of the eight and the best of the sixty were killed as a beef test. A large cattle-breeder used nothing but Shorthorn bulls to three hundred cows, and could only make some £3 or £4 of his grade yearling bulls. The same man now, by using Hereford bulls to the same cows, has sold his yearling bulls at £15 each.

Again, another farmer, who used to make £6 each of his grade Shorthorn heifers, makes £16 each off his grade Herefords at the same age. The fact that these men are no breeding enthusiasts, but practical American beef-producing farmers, goes a long way to show the turn things are taking in that country.

Weight and value of Hereford cattle.—At the last Smithfield show, Hereford steers in the class under two weighed, first prize, 13½ cwt., twenty-two months; second prize, 14 cwt., twenty-three and one-half months; and third prize nearly as high. The weights were tolerably even in all the classes. In steers under three, first prize was 17 cwt., at two years seven and one-half months; second prize, 16½ cwt., at two years eight months. In the class under four, first prize weighed 17½ cwt., at three years eight months; second prize, 18½ cwt., at three years four months. In heifers, first prize weighed 14½ cwt., at three and one-half years; second prize weighed 17 cwt., at three years two months. The winning cow was 20½ cwt., at eleven and one-third years.

No particulars of value can be obtained as to the performances of pure Herefords in milk, butter, or cheese. It is not used for draft of any kind, and it is chiefly bred in the west of England, Herefordshire, and Worcestershire, although many successful breeders are scattered throughout the country upon all soils. Herefords are driven to all the great midland fairs for farmers, who purchase them largely for fattening. The chief grasses grown are clovers, vetches, and the best perennials. That the Herefords will do well on heavy as well as light land is now admitted. We can point to cases within our own knowledge where at the Christmas markets Herefords brought in to fatten have beaten everything else in realizing top prizes, although in a county where they are comparatively little known.

Milking qualities of the Herefords.—The milking qualities of the Herefords have no doubt been seriously neglected in the past, and are similarly treated by breeders generally at present; but there is no reason for doubting that as milkers the existing herds show a very considerable improvement. As a rule the Hereford cows, when contrasted with extremely large bulls and oxen, are somewhat small, but is, of course, in no way small as we apply this term to Kerries, Ayrshires, or Channel Islands cattle. The cause of the undevelopment of good milking qualities in all Hereford herds is not far to seek. The soil of the locality which saw the breed originate is admittedly not suited to dairy cattle, consequently there is not that attention given to the improvement of the herds as milkers as would be the case were they in a district better suited to further their dairy properties. In its original habitat the custom which prevails is to regard the steers as the source of pecuniary profit, and whereas in most other parts it is the general practice to give the females the preference in rearing, it is much more usual for both male and female Hereford calves to be similarly treated, the preference being given to the males. This practice largely obtaining is obviously calculated to prove detrimental to milking properties. The outcome of all this is that, as a rule, the Hereford is wanting in dairy qualifications. But, on the other hand, the exception does not strengthen the rule, even if it proves it, for where pure bred Hereford stock is kept purposely for dairy requirements, where the good milkers are kept, and the bad and indifferent are weeded out, it is soon very obvious to the most prejudiced that high milking qualities are resident in the Hereford.

(6) SUSSEX CATTLE.

Mr. Forster, of Otham, Kent, a well-known breeder, says:

The Sussex, as a rule, are very poor milkers, giving scarcely, if ever, sufficient to rear their own calves, and are worse butter-makers. Their weight, of course, differ

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MESSRS. J & H HEASMAN'S SUSSEX COW



Julius Brander's work





MR J S HOUGSON'S SUSSEX HILL

W. J. H. & Co. Lith.

according to the system of feeding. A Sussex heifer last Christmas, which I exhibited, under the age of four years, showed a weight of 148 stone of 8 pounds to the stone, and a steer exhibited last year, aged two years and eleven months, weighed 196 stone. These were specially fattened for exhibiting, but, as a rule, steers killed under three years and fattened in the usual way would scale from 90 to 112 stone. They require good loamy soil, and the better the grass the earlier they can be made to reach the butcher. It is a great thing to keep all young stock well from birth, housing warmly and feeding them liberally with a little linseed-cake and cracked corn from weaning time. The steers are used very little for draft purposes.

With regard to the housing of the Sussex, one must be guided by the accommodation which his farm buildings afford, but at all events young beasts should be kept warmly housed. I use for feeding, in addition to what I have referred to above, a mixture of oil-cake and corn, and a few roots are advisable. As to breeding, this is a great secret. Ascertain the weak points of a cow, and, if possible, counteract them by selecting a bull perfect in the deficiencies of the other. I think more depends on the selection of a good bull than anything else, and I do not consider any price too exorbitant for a perfect, good colored and constituted animal.

Mr. Page, another large breeder, says:

The Sussex cattle, as a rule, are bad milkers, but capital flesh-makers, and if well-bred, make it up quickly. I seldom keep them for milking, but bring up calves with them. The following are the measurements and weights of a few Christmas beasts which were shown at Islington and took prizes:

Sussex heifer, three years old, 7 feet 8 inches by 4 feet 9 inches = 55 score. Live weight 15 cwt., 1 quarter.

Sussex heifer, 1 year 11 months, 7 feet 7 inches by 4 feet 8 inches = 52 score. Live weight 14 cwt., 3 quarters.

Sussex steer, 1 year 11 months, 7 feet 4 inches by 4 feet 4 inches = 46 score. Live weight 12 cwt., 3 quarters.

At the above show, in December, 1883, the first prize steer, twenty-one months, weighed 1½ cwt.; the second prize, twenty-two and a half months, 13½ cwt. The first prize steer, two years eleven and three-quarter months, weighed 19 cwt.; the second prize, two years seven and a half months, 14 cwt. The first prize steer, three years eight and one-quarter months, was 18½ cwt.; the second prize, three years nine and three-quarter months, 20½ cwt. The first prize heifer, three years nine quarter-month, scaled 16½ cwt.; the second prize, three years and one-quarter month, scaled 16½ cwt.; the third prize, three years two months, 14 cwt. The first prize cow, five years eight months, weighed 14 cwt.; the second prize, six and three-quarter years, 15½ cwt. The Sussex beast is a very large-framed red beast, entirely whole-colored, and rather higher on the legs than the Devon. Although it is largely grazed upon the Sussex Downs, the breeders prefer the hair to be long and silky, these generally having a mellow skin and feed better. In the majority of cases it is the custom to work the steers from three years old until they are six or seven, when they are generally put up to fatten, which they do rapidly. The heifers are seldom bred from until they are two and a quarter years, producing their first calf at three years. In working, all the oxen are kept in good condition, for if too fat it is most difficult to bring them back to a fleshy state afterwards.

The points of the Sussex are as follows: Eye rather prominent; wide across the forehead; neck medium in length and cleanly made under, with a small dewlap, the upper part of which is straight to the head. The nose is rather wide and thin between the nostril and the eye, the tops of the plate bones are not overwide and thin between and without any projection at the shoulder point; the breast is wide and projecting forward; straight fore-legs, bone rather fine, medium in length; back straight between the shoulder-blades and with the hollowness which is generally seen when the ribs are wide; body very round, with a straight chine; broad ribs, decidedly narrow between the first rib and the hip bone; loin flat and nearly as wide at the fore as at the hind end, each side lying on a level with the chine, and almost parallel—if the ribs are well sprung this will generally be the case; hip bones broad, with a wide band wide at the setting on of the tail; the tail should drop exactly between the tip of the rump and what is generally known as the first touch; the outside of the thigh fat, without fullness behind.

In breeding, the calf is seldom allowed to take all the milk of the cow, which is taken from it all day. It is allowed to suck two of the teats after the milkmaid has taken the other two, getting in addition to this a small quantity of bran or ground barley throughout the day, but is taken from her for the night. A portion of the cow's milk is then taken and the calf allowed to suck under. This is the usual practice until the calf is weaned. It is then fed upon cut grass, clover, hay, and bran until it is turned out upon the pasture, when the meal feeding is increased.

until the following winter, when it takes its place among other yearlings in the yard and is allowed to browse upon the various products of the farm, getting a certain allowance of roots, meal, and cake each day.

In Sussex the oxen are generally worked with a double yoke until they attain their full growth, at 6 years. As the ox is a slow mover, it is injurious to drive him too fast, and this is the case with the Sussex. When first yoked, steers should be kindly treated and worked an hour or two only in the day with steady older beast, that they may be gradually broken into the work. Those working together should be of equal strength and height, otherwise the weaker animal will do more than his share, and, perhaps, tax his strength too far. The weaker beast may have an advantage given it, if such is required, by slightly altering the chain of the yoke. In hot weather Sussex cattle must not be driven too hard or the constitution will be affected.

The following is an old system in Sussex for working cattle in succession: To bring 8 steers into work each year, it is necessary to save 16 calves, 10 males and 6 females. Eight of the best steer calves should be brought into work when three years old, and the remaining 2 may be turned off to fatten. The 6 heifers may each produce a calf at three years old, when the breeder should select 4 of his best heifers to put into his dairy, and the other 2 be sold or turned off to fatten when they have reared their calves. By this means a team of 24 working oxen and a dairy of 20 cows may be kept up. Thus, 8 three years old, 8 four years old, 8 five years old. As these arrive in succession at six years old 8 will be turned off the team, either for sale or grazing on the farm; when 8 three-year-old steers will be brought into the team to supply their places.

Experiments have been made to test the advantages of yokes or collars, and it has been pretty conclusively shown that the Sussex yoke is the best system known. In one trial between 6 beasts yoked and 4 in collars there were but three minutes' difference in an acre, which was well ploughed in 4 hours and 10 minutes. Stall-feeding is practised in some cases in Sussex, when a manger, water-trough, and fodder-rack are provided. One gentleman gives his working oxen 2 bushels of chaffed oats-straw daily, with 3 gallons of barley or beans and bran mixed. Sometimes barley or pollard is used instead of the beans or bran, and when potatoes are given, which is sometimes the case, a portion of the corn is knocked off. Hay is seldom given except the beasts are at work, and then only as a bait. In fattening these beasts this gentleman gave the same quantity of chaff and just double the quantity of the other foods. His beasts are fed twice a day and the chaff is steamed. The cows in the winter time are also largely fed on oat-straw, with bran and potatoes, but in summer dairy cows get no corn at all.

(7) JERSEY CATTLE.

The following are the points of Jersey cattle as established by the Jersey Agricultural Society:

The cow and purity of breed.—On both parents' side reputed for producing rich, yellow butter—four points; head small, fine, and tapering; eye full and lively; face lean and of a smoky color; muzzle fine and encircled with white; horns polished, a little crumpled, tipped with black; ears small and of an orange color within; back straight from the withers to the setting of the tail; chest deep, and nearly on a line with the belly—four points; hide thin, movable, but not too loose, well covered with soft hair of good color, two points; barrel-hooped and deep well-ribbed home, having but little space between the ribs and hips; tail fine, hanging 2 inches below the hock—four points; fore legs straight and fine; thighs straight and long, close together when viewed from behind; hind legs short, the bones rather fine; hocks small, not to cross in walking—two points; udder full, well up behind; teats large and equally placed, being wide apart, with veins large and swelling—four points; growth, one point; general appearance two points; perfection for cows and heifers, three points.

The bull.—The points desirable in the female are generally so with the male, but must, of course, be attended by that masculine character which is inseparable from a strong and vigorous constitution. Even a certain degree of coarseness is admissible, but then it must be so exclusively of a masculine description as never to be discovered in the females of his get. In contradistinction to the cow, the head of the bull may be shorter, the frontal bone broader, and the occipital flat and

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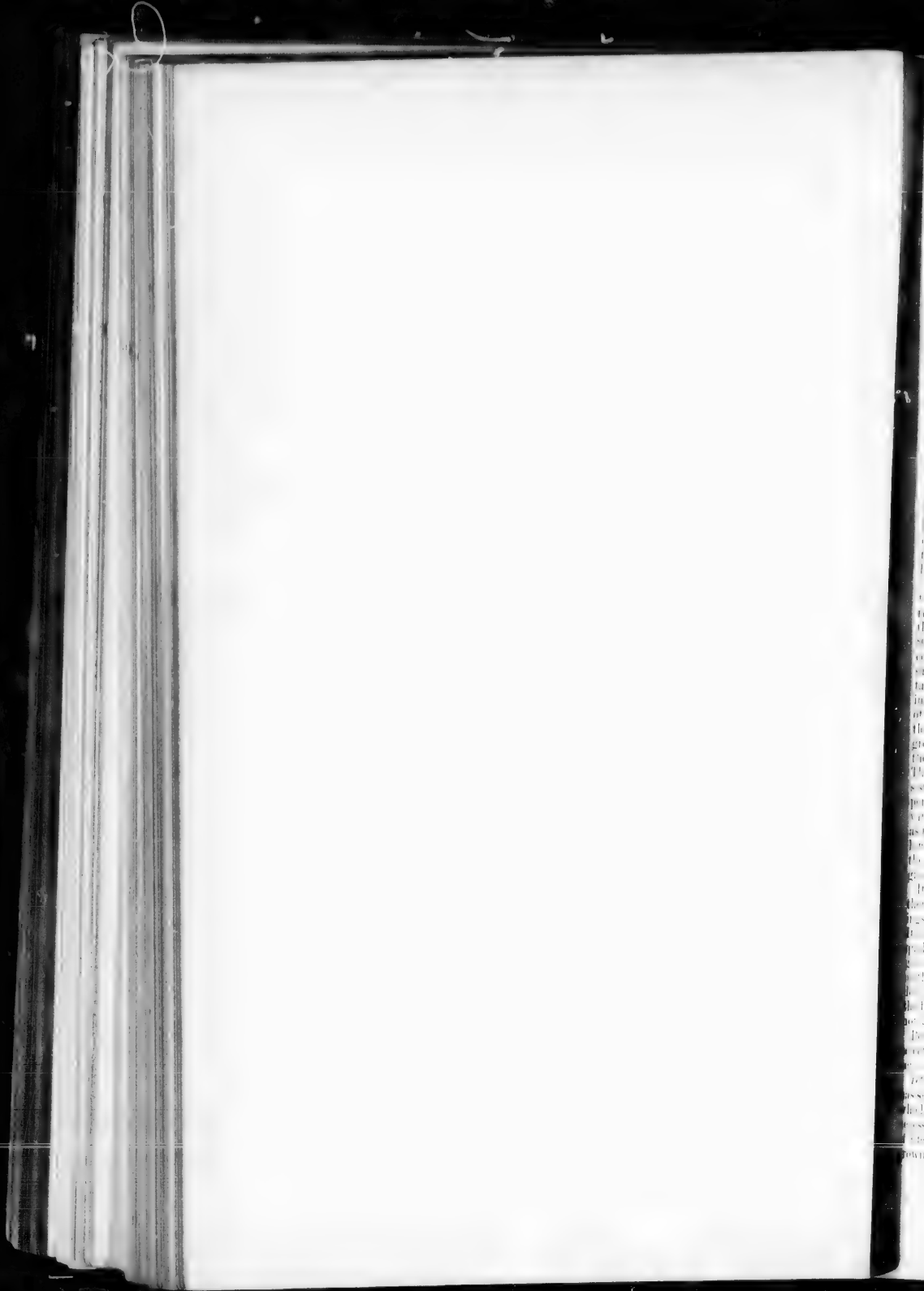
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stronger, that it may receive and sustain the horn, and this latter may be excused if a little heavy at the base, provided its upward form, its quality and color, be right. Neither is the looseness of the skin attached to and depending from the under jaw to be deemed other than a feature of the sex, provided it is not extended beyond the bone, but leaves the gullet and throat clean and free from dewlap. The upper portion of the neck should be full and muscular, for it is an indication of strength, power, and constitution. The spine should be strong, the bones of the loin long and broad, and the whole muscular system wide and thoroughly developed over the entire frame.

Origin and improvement of the Jerseys.—Mr. Jonathan Smith, Jersey, says:

Our breed of cattle was originally the same as that of Normandy, of which Jersey forms a part, and with which it was once physically connected. Tradition says it was severed from the mainland about the same time (possibly by the very same tremendous irruption) when the sea swept over the pleasant fields of Eastern Kent and buried them forever under "the Downs," leaving no trace of what once had been, save the shifting Goodwin Sands. The effects of this disruption, so far as Jersey is concerned, are in every way most interesting. The mainland of Normandy has lost everything but the name; her too-powerful neighbor, France, has robbed her of her independence, her laws, and even her language; and the ancient home of our kings has for centuries been a province of France. But for the strip of silver sea, such must have been the fate of Jersey. As it is, she has successfully repelled all attempts to the very laws which her Duke William introduced into England at the Conquest, and her mother tongue is that which the Conqueror spake himself.

The "*Romanes de Rou*," written by our Jersey poet Wace, for Henry II, in the twelfth century, is still the language of our farmers, though unintelligible to the Parisian of to-day. Jersey has the same forms of self-government, the same land tenure, the same laws and language, the same manners, customs, and habits that she had 800 years ago. And so with her cattle. The silver streak separating Jersey from the continent converted it into one great farm, with the sea for its ring fence; and the same conservative spirit has been effectual in keeping the breed pure from any foreign taint. Jersey has thus enjoyed for centuries the very happiest conditions for producing a distinct and excellent breed of cattle, to which must be added the advantages of her climate, equally free from arctic cold and burning heat, which permits her cattle to be outpastured almost every day in the year and keeps her fields perennially green. These favorable conditions have been put to advantage. The original stock, the Normandy breed, has long been (and still is) famous for its butter qualities. These have been steadily and perseveringly developed by our farmers, who have perfected by simply following out this one idea—butter! Hence it has been the invariable custom for ages never to use a bull before seeing his dam and being satisfied as to her yield of butter. Unless this proved satisfactory, no other point in the bull pleased himself or his dam availed anything; nobody would use him. This idea still governs the vast majority of our island breeders and those of America, and doubtless still greater triumphs await them in the udders of the future.

It is much to be regretted that of late years some English breeders have taken upon themselves to set up a new standard—solid color; that is, the absence of white markings on the coat—which has absolutely no foundation at all but the oddest caprice. It is either a peculiarity of the breed nor a sign of purity of race, nor of any other quality, whatever, bad or good; it is simply a blind alley leading nowhere. The sin of the energies of all our breeders in one direction for so long a period which has been the chief agent in improving the breed and making it what it now is. The best of butter cows. Let us hand down the breed to our children at the least as good as we found it.

Besides the steady pursuit of one object for so many generations, and the careful selection of sires to that end, there are two other peculiarities of management in Jersey which are worthy of notice. The first is the care in feeding the calves by hand. This doubtless originated as a matter of necessity, and has been constantly divided at the death of the owner among his children, and passed on to each farmer felt, in the olden time, to raise as far as possible all the necessaries for himself, each farm had its patches of wheat, turnips, grass, cabbages, &c., growing side by side, often all in the same field. Hence the necessity of confining

the cow in some way to keep her from damaging the allotment—like crops. The Belgians, whose farms are of the same small allotment type, have met the same difficulty in a different way; they keep their cows shut up, and carry them all their fodder. The Jersey method is more natural and wholesome, less laborious, and has produced better results. It has originated a new type, the best butter cow in the world, unique also in gentleness and beauty. The advantages we claim for tethering are:

(a) Economy of food.—Some good judges have put this as high as 50 per cent. They assert that three tethered cows may be kept where otherwise two could only be kept. But no one in Jersey is willing to put it lower than one-third; where three only could find pasture loose, one may increase his stock one-third and keep four cows if he tethers them. The grass is eaten up clean, fine and coarse alike; none is left and none spoiled.

(b) The feed is regular and equal. The cow is not pampered one day and starved the next; its appetite is not spoiled, nor its digestion deranged.

(c) It gives perfect command of the food supply. A cow can have much or little, a long tether or a short one; it can be confined to a poor corner or favored with the fat of the land, as may be necessary or desirable.

(d) It saves fences and economizes food that would otherwise be wasted, from the impossibility of letting in a loose cow to graze it.

(e) The cow is more gentle. Its keeper is its good genius, on whom it is constantly dependent for all it wants. Its docility (and affection even) follows as a matter of course.

(f) It is doubtless to the tether that our Jersey cows are indebted for their exquisite fineness of limb, their airy grace, and general elegance of proportions and appearance.

(g) More butter is obtained. Nothing is so destructive to animal fat, whether on the flesh or in the udder, as motion and exercise. This is so well known as to be proverbial, yet how often is it overlooked. The same farmer who fats his bullocks quietly in a stall will give his cows the run of a large pasture, as if they were in training for a race.

Rearing calves by hand in Jersey.—Much importance is attached to this practice in Jersey. The calf is never allowed to suck at all, and has, therefore, never to be weaned. The rearer has perfect command of the calf's food and can vary it as needed. Like tethering, it increases the animal's docility and its attachment to its attendant, on whom it has to depend from the very first. The effect on the cow is equally good. Having never suckled her calf, she does not fret when it is taken from her. More important still, having never yielded her milk in any way but to the gentle persuasion of the milkmaid's hand, she is not tempted to withhold it.

Milk vs. butter yield.—Mr. Walker says:

While cows giving exceptionally large quantities of milk will sometimes make large butter tests, as a rule the two things do not go together; they are inconsistent with each other. Breeding for quantity of milk is sure to depreciate the quality and reduce the butter yield. It is the opinion of many of the most skilful breeders of Jersey, and those of longest experience, that by judicious selection of individuals from particular families it would be far easier to carry the milk yield of a family of Jerseys from an annual average yield of 6 quarts of milk per day up to 12 quarts per day than it would be to carry an annual daily average yield of butter from 12 ounces up to 15 ounces per day. That is to say, it would take a less number of generations from the cows with which the breeder started to double the flow of milk of a family than to increase their butter yield by one-half. In other words, it is a problem of far more difficulty to increase the butter yield of cows than to increase their milk yield. Every careful observer knows that the number of quarts a cow is giving will fall off very considerably without materially reducing the pounds of butter she will make.

It has taken centuries to produce the richness of milk of the Jersey cows. It has been done and is being done against the ordinary workings of the laws of nature. It is against natural laws that the milk from a cow should be so rich as to kill her calf, and the struggle of nature is to reduce the richness by increasing the quantity; therefore the breeder must never attempt to increase his butter yield by coupling an animal from a family yielding a large quantity of milk of poor quality with those giving rich milk in less quantity. The result, as a rule, must, in the nature of things, be the opposite of that which the breeder seeks. The only way to maintain, to say nothing of increasing, the butter product of any family that is making exceptionally large yields of butter, is to couple those animals that spring from the very best specimens of the same family, when not already in-bred too far, and of the very best proved ones, when out-crossing is desirable.

The thing to be done with the Jerseys giving large quantities of milk of inferior quality is to abandon them to milkmen, whose only object is quantity of milk, not quality. They have a keen eye for large milkers among Jerseys, as every one knows who owns Jerseys, or who buys Jersey milk in any city or large town. Breed from

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the best butter families under all circumstances. Never fight against accomplished facts. He who fails to avail himself of all which his neighbors have accomplished in breeding, by neglect to use the blood that has been thoroughly developed, on the ground that he "probably now has as good," will disastrously fail in his undertakings. It is simply blind egotism that must inevitably meet its fate.

Treatment of Jersey calves.—Under this head each breeder would write a different treatise. No two probably agree, and while I claim no special fitness to discourse upon this topic, and therefore have no right to speak authoritatively, still, as I have some distinct notions upon the subject, I herewith submit them, hoping that by an interchange of views those methods that are the best may be made certain by a comparison of the experience of different breeders.

The milk of a very rich Jersey cow is far too rich for her calf. If she has a large flow immediately after calving, the calf will only take a portion, and that the poorest in quality, and be comparatively safe if left with its dam for two or three days. If the cow is slow in "coming to her milk," and what the calf gets is above the average richness, it will, in many instances, be as fatal to the calf as a dose of poison. Every year scores of Jersey calves have "died very mysteriously," when the truth was, the milk of their respective dams was too rich for them. When a Jersey cow drops her calf, remove it immediately, if the cow is in health. If the cow is nervous, and frets badly, fence the calf off in one corner of the box, so that the cow can reach it and comfort herself with it.

Feeding the calf.—Give a pint of the milk first taken from its dam every few hours a few times, milking every drop of the remainder from the udder at each time. Afterwards feed about two quarts of the milk first taken from its dam (as that is much the all at 100°) skimmed milk to each feed, increasing the skimmed milk and lessening the whole milk as the calf thrives until all the whole milk is withdrawn by the calf at blood heat. Keep good, bright, clear, sweet rowen, and also good hay, by the calf from nearly the first. Put a fresh cut sod by the calf every few days. If the calf is costive, give the milk cooler; if too loose, give the milk at as high a temperature as the calf will take it, and in much smaller quantities. Give one-third the quantity of hot milk, and give two raw eggs, broken into its milk, night and morning, or the eggs alone. If the diarrhoea does not readily yield, give a tablespoonful of castor oil and the same of olive oil, with a teaspoonful of paregoric, mixed in a pint of hot milk. Sometimes, in desperate cases, a light feed of pure beef tea two or three times, or even longer, in place of the milk food, will act favorably. Less food and hot, with little or no medicine, is the general rule. Do not resort to medicine too hastily. The eggs rarely fail. Never give any medicine if it can be avoided. Al- charcoal. Follow the oils with a teaspoonful of pulverized chalk and pulverized until the symptoms disappear, substituting the charcoal occasionally.

Calf-fattening.—If calves are wanted to be always fat and sleek, in a fit condition to sell to the butcher or to persons of no practical experience, who want to see things looking fine, and the breeder cares nothing for the value at the churn of the developed animals, feed oil-meal boiled for hours in a large quantity of water until the liquid is of about the consistency of thin mucilage; or feed fine corn-meal, or any thing else that will produce fat. If the object of the breeder is to have his young things "fill the eye" of the inexperienced, and to sell them to such persons for long prices when young, always keep them fat and sleek. If the object of the breeder is the honorable one of producing an animal the superior of its progenitors, or at least their equal, to sacrifice any prospect of immediate gain to the production of the best practical cow possible at the churn, he will pursue a far different course. Feeding their largest future usefulness. To feed any substance especially calculated to produce fat to a bull, or at any time before she comes in milk, to a heifer, will induce the habit of laying on fat, which will continue through all its subsequent career. The younger the animal is when this bad habit of making flesh and fat begins, the more controlling it will be, and the more likely the animal will be to transmit that habit to its offspring.

Food, &c.—Nothing should be feed to bulls more stimulating than good hay, and at times a few oats, shorts, or both, with coarser food. Plenty of coarse hay, straw, and grass even should be given at times. The digestive organs of a butter bull, especially when young, should be taxed and distended precisely as should those of a female dairy cow, hay, straw, in fact, everything to distend and tax their digestive organs, and with nothing more stimulating before they drop their first calf than oats or shorts or similar food. The rule for keeping young heifers to make good coats is rather extravagantly expressed by saying, "A heifer should have a paunch large enough to

turn itself round in." Unsightly as they are in such a condition, such heifers make the best cows.

Oat-meal, corn-meal, or anything else necessary, should be fed as an alternative to keep a young animal in a thrifty growing condition which is, from any cause, getting out of condition, or to restore one that is off. But an animal that maintains its vigor and thrift with none, other things being equal, gives far more promise of future usefulness than one that must be pampered. The rule is to feed just enough of such things as are found necessary to keep the animal in a thrifty growing condition and no more—the less the better—and never allow a milk or butter animal to lay on fat. Experienced dairymen never go into herds that are fat and sleek for their cows. They know that the feeding necessary to produce such conditions in milk and butter animals impairs their power to accomplish the thing for which they are to be kept, namely, the making of milk or butter. Meat, not milk or butter, is what they will ever after make. They will "take better care of themselves than of their owners."

Yield of Jerseys.—The following instances have been recorded among others sent in to the newspapers by Jersey breeders:

Quayle, in his "General View of the Agriculture of the Islands on the Coast of Normandy," says that instances are named of 14 pounds of butter in a week, and that instances of 12 pounds are well attested.

Mr. H. D. Ingles, in a work on the Channel Islands cattle, published after a two-years' residence on the island, says the general average produce may be stated as 10 quarts of milk per day and 7 pounds of butter per week.

Gerard, in his description of the different varieties of cattle, says of the Jerseys in their island home: In one year the produce of a good cow in butter may be from 220 to 300 pounds (236 to 322 pounds English weight); some cows, in the season, may give 14 pounds per week.

Mr. Dauncey gave the average produce of his entire herd during the year 1867 as within a fraction of 7 pounds per head per week, dry or milking.

From Mr. Thornton's essay on Jersey cattle and their management, contributed to the journal of the Royal Agricultural Society of England, we learn that Mr. Fisk (Isle of Wight) gives his greatest return from fifteen cows as 10 pounds each weekly for several weeks. In the same essay we find Mr. Dumbrell's herd produced in 1875, from January to September, 7½ pounds per week but; as Mr. Dumbrell explains, we may assume the calculation is based on the period the cows were in milk, not on the entire nine months, dry or milking. Writing of the cows on the island, Mr. Thornton says 7 to 10 pounds of butter weekly is a fair standard, but 5 to 6 pounds per week throughout the year is a good average cow.

Mr. George Curzon, Eastcott, Watford, writes in the supplement to the English Herd-Book of Jersey cattle, that the produce of his cows in butter from the 1st October, 1881, to 30th September, 1882, averaged per cow 321 pounds 2½ ounces. This is an average of a little over 6 pounds per week throughout the year.

Lieutenant-Colonel Portal gives his average yield of butter per cow per week in 1881 as 4 pounds 14 ounces, and in 1882 as 5 pounds 13 ounces, but we append further particulars from him:

Home farm statement as to dairy produce, 1881.

Total yield of milk from 21 cows.....	gallons..	12,385
Butter made.....	pounds..	4,172
Cream used.....	pints..	321
Milk used.....	do..	3,131
Average yield of milk per cow per annum.....	gallons..	589
3,494 pints of milk = 218 pounds of butter.....	pounds..	5,352
323 pints of cream = 162 pounds of butter.....	pounds..	
218 + 162 = 4,972 = total butter yield.....	pounds..	351
5,352 - 4,972 gives per cow per annum.....	do..	41
Average yield of butter per cow per week.....	do..	

Home farm—statement as to dairy produce 1882.

Total yield of milk from 22 cows.....	gallons..	13,825
Butter made.....	pounds..	6,306
Cream used.....	pints..	381
Milk used.....	do..	3,171
Average yield of milk per cow per annum.....	gallons..	628
3,174 pints of milk = 198 pounds of butter.....	pounds..	6,306
381 pints of cream = 190 pounds of butter.....	pounds..	
198 + 190 = 3,807 = total butter yield.....	pounds..	31
6,306 - 3,807 gives per cow per annum.....	do..	
Average yield of butter per cow per week.....	do..	

He adds:

uch heifers make the

as an alternative to
in any cause, getting
it maintains its vigor
promise of future nec-
enough of such things
condition and no more
to lay on fat. Ex-
or their cows. They
milk and butter an-
e to be kept, namely,
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says of the Jerseys in
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island, Mr. Thornton
to 6 pounds per week

ement to the English
r from the 1st October,
2½ ounces. This is an

r per cow per week in
but we append further

1871.

.....gallons.. 12,385

.....pounds.. 4,972

.....pints.. 324

.....do... 3,491

.....gallons.. 589

.....pounds.. 5,352

.....do... 251

.....do... 4

1872.

.....gallons.. 13,825

.....pounds.. 6,305

.....pints.. 34

.....do... 3,171

.....gallons.. 625

.....pounds.. 6,095

.....do... 34

.....do... 1

Although I do not believe for one moment that the butter alone pays, yet with the skim milk the addition of calves and pigs makes the balance at the end of the year on the right side. We rear a good many calves of both sexes, and have no difficulty in disposing of them; keeping also 13 or 14 sows, and selling their progeny at thirteen or fourteen weeks old, as stores, pays well. The pigs are kept out in a three-acre pasture field in open weather and require at nights, when they come in, a little but skim milk and wash, which is not expensive. I do not think that keeping pigs on grass land is half enough adopted; it keeps them healthy, clean, and growing. A post and rail fence with strong sheep wire netting, keeps them from breaking out, and rings in their noses prevent their injuring the pasture. This last year I have no record worth preserving of my dairy results, as I lost some of my best cows in the summer, which has thrown me out terribly. My system is of the simplest kind. I have the quantity that I had one more cow in the dairy, and I gave all my cows 4 pounds of decorticated cotton-cake with chaff and mangel in the winter months when they were kept in, and 1 pound each through the summer months at each milking, or, in other words, 2 pounds a day. They had 2 pounds in the winter months, and more in the summer months. I shall hope this year (if I lose no more cows) to do better than last, as I have a very nice lot coming in from my young stock. As I seldom or never buy, a loss of a few cows affects me much. I have bought, but have never found any that please me as well as those I breed myself from either imported bulls (every one of which has taken a prize when in my possession) or from perfect bulls of my own rearing. I have no difficulty in selling either bulls or cows. By this means I know what I have got and what I am doing to improve my stock. By buying I should not know this in nine cases out of ten.

Among the detailed records sent into the British Dairy Farmers' Association for the challenge cup, the only one relating to Jerseys was Lord Braybrooke's, which is interesting and sufficiently good to be annexed, although the yield is certainly not so good as could be found upon many farms where Jerseys are kept by dairy farmers.

Dairy record of Lord Braybrooke's herd of Jerseys for 1882.

Average for 1882.														
Cows.	Borns.	Last calf.	Weeks in milk.	Milk.		Percentage.	Cream.		Butter.					
				Quantity.	Average per week.		Pounds.	Average per week.	Product to a gal. of milk.	Milk to a pound.				
Y.				Qrs.	Lbs.				Qrs.	Qts.				
1	1870	Aug.	10	47	3,138	5,371	45	118	10 5 to 21 5	15 8	299	64	7	1,720
2	1871	Aug.	9	37	1,476	3,837	34	112	12 5 to 21 5	16 8	175	64	7	1,720
3	1871	Apr.	8	32	1,400	3,751	34	117	10 5 to 21 5	15 2	199	64	7	1,720
4	1871	Nov.	8	30	3,600	9,180	42	154	9 5 to 20	14 1	361	64	7	1,720
5	1871	Nov.	6	12	3,260	5,880	35	110	10 5 to 21 5	15 1	312	64	7	1,720
6	1876	Aug.	5	30	2,785	7,128	36	112	10 5 to 21 5	14 5	352	64	7	1,720
7	1877	Sept.	5	49	2,295	5,991	46	122	15 5 to 26	19 5	348	64	7	1,720
8	1877	Feb.	1	38	2,363	6,110	62	161	11 5 to 21	14 7	317	64	7	1,720
9	1877	Apr.	3	26	759	1,970	29	98	11 5 to 19 5	15 1	105	4	1	614
10	1877	July	1	15	1,399	5,111	12	113	14 5 to 19 5	15 1	301	64	7	1,720
11	1878	Feb.	4	31	1,615	4,190	5	91	14 5 to 21	15 1	167	53	1	1,519
12	1878	Dec.	1	31	1,191	3,101	9	101	14 5 to 21	15 1	167	53	1	1,519
13	1878	Oct.	1	31	1,176	3,071	9	91	14 5 to 21	15 1	167	53	1	1,519
14	1878	Jan.	1	19	2,928	4,770	9	95	16 5 to 21 5	17 5	151	53	1	1,519
15	1878	Nov.	2	17	1,294	7,148	9	111	15 5 to 21 5	18 5	283	53	1	1,519
16	1878	Nov.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
17	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
18	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
19	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
20	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
21	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
22	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
23	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
24	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
25	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
26	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
27	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
28	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
29	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
30	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
31	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
32	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
33	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
34	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
35	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
36	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
37	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
38	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
39	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
40	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
41	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
42	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
43	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
44	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
45	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
46	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
47	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
48	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
49	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
50	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
51	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
52	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
53	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
54	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
55	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
56	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
57	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
58	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
59	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
60	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
61	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
62	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
63	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
64	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
65	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
66	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
67	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
68	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
69	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
70	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
71	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
72	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
73	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
74	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
75	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
76	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
77	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
78	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
79	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
80	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
81	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
82	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
83	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
84	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
85	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
86	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
87	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
88	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
89	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
90	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
91	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
92	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
93	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
94	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
95	1878	Dec.	1	17	1,294	5,366	9	111	16 5 to 21 5	18 5	283	53	1	1,519
96	1878	Dec.												

Analysis.

Description.	Milk.		Butter.		Skim-milk.	
	Quarts.	Pounds.	Pounds.	Quarts.		
Under 4 years of age:						
Average per cow for the year*	1,781	4,606	240	1,517		
Average per cow per week for the entire year	34	89	4 1/2	29		
Average per cow per week while in milk	40	105	5 1/2	34		
4 years and under 6 years:						
Average per cow for the year*	1,659	4,835	281	1,378		
Average per cow per week for the entire year	33	93	5 1/2	26		
Average per cow per week while in milk	40	101	7	38		
6 years and over:						
Average per cow for the year*	2,756	7,124	353	2,393		
Average per cow per week for the entire year	53	137	6 1/2	45		
Average per cow per week while in milk	54	142	7	47		
Entire herd, all ages:						
Average per cow for the year*	2,085	5,296	283	1,710		
Average per cow per week for the entire year	38	101	5 1/2	32		
Average per cow per week while in milk	40	103	6 1/2	39		

* In these calculations consideration is given to the period from the death of Nos. 2, 3 and 5 to the end of the year.

Average weight of milk per gallon.....	pounds	16 1/2
Average cream percentage.....	do.	17 1/2
Proportion of butter to milk ounces to a gallon.....		8 9/10
Proportion of butter to cream ounces to a quart.....		1 1/4
Proportion of milk to butter (quarts to a pound).....		7 1/2

Comparative richness of milk at different stages of the same milking, showing the great importance of thoroughly draining a cow's udder. (In each case the result given is the mean of six days' testing.)

Cow No.—	Percentage of cream.			Comparison		
	First 1/2 pint.	Last 1/2 pint.	Full udder, the entire yield.	First 1/2 pint.	Last 1/2 pint.	Full udder, the entire yield.
1.....	5.8	7.5	11.5	1	1.77	2.67
2.....	4.7	7.1	11.4	1	1.77	2.66
3.....	4.5	7.1	11.4	1	1.77	2.66
4.....	5.4	7.1	11.4	1	1.77	2.66
5.....	4.8	7.1	11.4	1	1.77	2.66
6.....	8.2	10.1	15.8	1	1.89	3.91
7.....	7.1	10.1	15.8	1	1.89	3.91
8.....	5.4	12.8	17.2	1	2.37	3.88
9.....	7.1	10.1	15.8	1	1.77	2.66
10.....	6.1	10.1	15.8	1	1.77	2.66
11.....	5.0	10.1	15.8	1	1.77	2.66

Food of cows during the year 1883, with one or two trifling exceptions in individual cases.

Jan. 1 to Feb. 19.—1 peck bean meal, 1 bushel timothy, 1 bushel clover hay, 1 bushel alfalfa, 8 pounds hay, 10 pounds carrots per day, twice a day, 10 pounds corn meal, 10 pounds grass.

Feb. 20 to Apr. 2.—The same, with 10 pounds of mangels instead of carrots, three to six hours grass.

Apr. 3 to May 7.—Hay reduced to 4 pounds, 10 pounds timothy, 10 pounds clover hay, 10 pounds alfalfa, 10 pounds grass.

May 8 to May 21.—1 peck bean meal, 1 peck grass, 1 peck malt dust, 2 pecks chaff, 4 pounds hay, 10 pounds mangels, 10 pounds timothy, 10 pounds clover hay, 10 pounds alfalfa, 10 pounds grass.

May 22 to July 9.—1 peck bean meal, 1 peck grass, 1 peck malt dust, 10 pounds chaff, 10 pounds manure, 10 pounds timothy, 10 pounds clover hay, 10 pounds alfalfa, 10 pounds grass.

July 10 to 20.—1 peck bean meal, 1 peck grass, 1 peck malt dust, 10 pounds chaff, 10 pounds timothy, 10 pounds clover hay, 10 pounds alfalfa, 10 pounds grass.

Aug. 21 to Oct. 20.—1 peck bean meal, 1 peck grass, 1 peck malt dust, 10 pounds chaff, 10 pounds timothy, 10 pounds clover hay, 10 pounds alfalfa, 10 pounds grass.

Oct. 21 to Nov. 20.—1 peck bean meal, 1 peck grass, 1 peck malt dust, 10 pounds chaff, 10 pounds timothy, 10 pounds clover hay, 10 pounds alfalfa, 10 pounds grass.

Nov. 21 to Dec. 31.—1 peck bean meal, 1 peck grass, 1 peck malt dust, 10 pounds chaff, 10 pounds timothy, 10 pounds clover hay, 10 pounds alfalfa, 10 pounds grass.

Percentage of cream from the milk of the entire herd, for each week in the year 1882.

Butter.	Skim milk.	Week ending—Percent.	Week ending—Percent.	Week ending—Percent.	Week ending—Percent.
1. 240	1,513	Jan. 4 17.73	Apr. 9 14.76	July 9 12.8	Oct. 8 17.7
2. 4	29	Jan. 11 17.73	Apr. 16 15.74	July 16 12.72	Oct. 15 17.7
3. 5	34	Jan. 18 17.42	Apr. 23 15.98	July 23 12.66	Oct. 22 17.2
4. 5	1,555	Jan. 25 16.11	Apr. 30 15.99	July 30 14.4	Oct. 29 16.4
5. 5	29	Feb. 1 15.96	May 7 14.63	Aug. 6 13.64	Nov. 5 16.5
6. 7	38	Feb. 12 14.29	May 14 14.98	Aug. 13 14.37	Nov. 12 17.5
7. 354	2,063	Feb. 19 14.52	May 21 14.86	Aug. 20 15.4	Nov. 19 17.5
8. 5	45	Feb. 26 14.23	May 28 14.61	Aug. 27 13.8	Nov. 26 16.9
9. 7	47	Mar. 5 14.69	June 4 14.83	Sept. 3 15.1	Dec. 3 17.5
10. 5	1,710	Mar. 12 16.16	June 11 14.97	Sept. 10 15.5	Dec. 10 18
11. 5	32	Mar. 19 17.17	June 18 15.86	Sept. 17 15.9	Dec. 17 17.3
12. 6	39	Mar. 26 16.79	June 25 13.77	Sept. 24 16.5	Dec. 24 17.8
13. 5	39			Oct. 1 16.5	Dec. 31 17.5

Butter to a gallon of milk, and milk to a pound of butter, in comparison with its cream percentage as shown by the year's testing.

Cream.	Butter to a gallon of milk.	Milk to a pound of butter.	Cream.	Butter to a gallon of milk.	Milk to a pound of butter.	Cream.	Butter to a gallon of milk.	Milk to a pound of butter.
Per ct.	Ounces.	Quarts.	Per ct.	Ounces.	Quarts.	Per ct.	Ounces.	Quarts.
8.	41 to 42	13 to 14	13.	74 to 8	8 to 9	17.5.	93 to 103	31 to 64
8.5.	42 5	13 13	13.5.	75 8	8 8	18.	10 11	31 64
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11.5.	48 5	13 13	16.5.	81 8	8 8	21.	12 12	31 64
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The proportion of butter to cream has varied during 1882 from 164 to 183 ounces to a quart.

Lord Braybrooke's figures are given as an example of an ordinary English herd, which, although about the oldest in the Kingdom, is certainly not above mediocrity, although the yield is such as to make it decidedly profitable. The best butter-making cows in England are undoubtedly those which have about three-fourths Jersey blood and one-fourth Red Poll, Devon, or Shorthorn.

Statistics of an Isle of Wight Jersey herd.—Mr. J. R. Fisk, of Brightstone, Isle of Wight, who has kept Jerseys for a number of years, declares his belief that they will produce a larger quantity and better quality of butter than any other breed on the same amount of food. He says:

I have compared them with other breeds in the island, and I am quite satisfied that they are the best. I know of no other breed as to butter, but they are certainly the best. The constitution is not so delicate as is generally supposed. With the exception of the occasional cow which is affected by the disease known as "the rot," the cows are healthy and strong. The cows are of various colors, some being broken. The breed which was originally imported into the island was broken, and a whole-colored cow was seldom to be seen. The cows are not housed in the winter, but are kept in the open air, and are fed with hay and straw. As soon as the cows are milked, they are put into the pasture, and are fed with a mixture of cotton cake, 1 bushel of mangel wurzel and hay, and a ran on a fresh pasture for an hour or two in the afternoon. The cows are milked at 4 o'clock in the morning, and at 4 o'clock in the afternoon. I continue the meal or cake as long as the cows are milked, and vary the quantity according to the feed they obtain on the pasture.

The young stock have a yard with a shed, and feed on hay, with a few roots or 3 pounds of cake per day through the winter, and a run on the rough pasture through the summer. The heifers are allowed to go to the bull at fifteen months old. The calves which are weaned are taken from the cows from three days to a week old, and as soon as they will drink well and are strong they are kept on skim-milk, good hay, and a little corn-meal until three or four months old. If it should be summer they are turned out on the pasture in the day and housed at night until they are old enough to lie out. I bleed the calves dropped in the spring, in the fall of the year, as a preventive for quarter-evil. I reckon that my whole herd in summer, including heifers, give 12 quarts of milk per day, but I have several cows which would give 20 quarts. I have a record of 20 cows giving in the month of June, 1883, 256 quarts of milk, 29½ pounds of butter, per day, and 1 cow 112 quarts of milk, 11 quarts of cream, and 12 pounds of butter per week three months after calving. The average yield of butter throughout the year for 17 cows and 6 heifers is 6½ pounds per head. In the height of summer 13 cows averaged 12 pounds each per week.

The weight of a bull or cow when fattened is from 28 to 35 score. The Jerseys are seldom steered. If the bull calves are not required for stock they are allowed to suck the dams, and fattened as calves, weighing from 60 to 100 pounds at one to two months old. The mean temperature on the average for 16 years worked out as 49°.38°. In the winter it was 39°.99°; spring, 46°.92°; summer, 59°.63°, and in autumn, 50°.78°. During one year there were 212 days on which a southwest wind was prevalent; 72 days with a northeast, and 40 with a northwest wind. Southeast winds are very rare. The island rests on the Wealden, and the surface comprises clay, gravel, sand, chalk, freestone, and loam. The downs are chalk, rising from 400 to 800 feet above the level of the sea. The grasses which are chiefly cultivated are the several sorts of rye grass, including the Italian. Clovers are broad, Dutch, alsike, trefoil, cow clover, and trifolium.

(8) GUERNSEY CATTLE.

This really first-rate breed is a native of one of the Channel Islands, off the coast of France, and is largely bred by a class of farmers who hold small quantities of land which they cultivate very highly, and, like the Jersey people, breed a much larger number per acre than is done in any part of England. They are a most docile race, well cared for in sheds in the winter, and almost invariably tethered in summer on the grass. There is no difference of opinion in England as to the merits of the Jersey and the Guernsey among those who understand both races, but it must be admitted that the Jersey is a very much greater favorite, although why it is so would be very difficult to say if we did not think that color and a more deer-like form has something to do with this. The Guernsey is a much larger beast than the Jersey, and, although coarser, is still extremely delicate in texture of skin, while she is much more fleshy, is far more easily fattened, and is salable to the butcher at almost any time, provided she is well kept, which the Jersey certainly is not. Indeed, it may be fairly estimated that when an old Jersey cow past breeding is only worth £7 to £8, a Guernsey is usually worth £15.

This race is now bred with extreme care, although it has some faults from a butcher's point of view, being bred for milk almost alone, and by a comparatively small number of breeders. The color is, plainly speaking, an irregular yellow and white, or, according to the shade, as it is generally called, orange or lemon and white. It is a grand butter-making cow, and will equal the best Jerseys, while it is certainly a deeper milker. We may here mention that the Guernsey breed is strictly confined to the island of Guernsey, as the Jersey is to the island of Jersey, and although the last named was for many years known as the Alderney, it is so no longer, for the Alderney people have at last started a herd book for their own race, which they are determined to perfect in the same way as the other breeds have been perfected. Guernsey, small as it is, exports between one and two thousand cows annually, the majority of which come to England, and at the present

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time the demand for really good cows is considerably greater than the supply, the only breeders who breed carefully finding it at all times difficult to obtain what they want.

This breed is one which it will pay any butter-maker to take up and perfect, for it certainly has, as will be seen from what we have said and what we shall show, a far wider scope of usefulness than the Jersey can possibly have while it is bred in its present form. For crossing the Guernsey imparts quality of milk without that loss of quality of flesh which is generally found in beasts crossed by the Jersey. The butter, like the cream, is always wonderfully rich in color, and extremely delicate in flavor, and many cases can be quoted in which 700 pounds have been reached in the twelve months, although these, of course, are exceptional, while, with regard to the quantity of the milk, it is generally found that 8 quarts is within the mark, good herds often yielding an average of 16 quarts per day during the best months, although, as with other cattle, individual animals frequently exceed 20 quarts.

Another good feature in the Guernsey is the fact that it is not only a good milker after calving, but continues to milk well during the whole season. In form it is generally fine and narrow in front, widening until it reaches the hips, which are broad. The udder is large and flat, the teats long and wide apart, and the escutcheon perhaps more prominently pronounced than in any other race. It is generally believed that one or two Guernsey cows in a herd in which the milk is less rich imparts quality and color to the whole of the butter made. Cheese is not made from this race, except in isolated instances, and then only for private use. It does well upon all soils, and we know instances in which its returns are enormous, although the situation is as bleak and exposed as the Welsh hills. At the same time a chalky or a gravelly soil is preferred. In its native island and in the south of England it does better work than in the north, but some of the northern breeders are much pleased with the results they obtain from it, and do not seem to consider it at all inappropriate to their districts. It is never used for draft purposes.

Experience of Guernsey breeders.—Mr. J. de Garis, Rouvets, says:

My herd in 1882 consisted of 1 cow, fourteen years of age, calved February, 1882; 1 cow, ten years old, calved December, 1881; 1 cow, four years old, calved March, 1882; 1 cow, same age, calved July, 1882; 1 heifer (first calf), calved May, 1882. I used not less than 4 quarts of milk daily in my family. The following are the amounts of marketable butter made each month: January, 69 pounds; February, 70 pounds; March, 96 pounds; April, 134 pounds; May, 96 pounds; June, 109 pounds; July, 136 pounds; August, 132 pounds; September, 151 pounds; October, 112 pounds; November, 77 pounds; December (partly estimated), 80 pounds; total, 1,262 pounds; average per cow, 252 pounds.

Mr. W. Carrington, of King's Mills, says that his cow *Le Cheminant* produced an average of 16 pounds per week for months after calving.

Messrs. C. Smith & Son state that three cows owned by them gave the following records:

Vesta, born March 1, 1873, calved May 7, 1882, served June 11, 1882, in five days—December 4 to December 8, inclusive—gave 60½ quarts, an average per day of 12½ quarts; Vesta Second, born April 25, 1877, calved October 12, 1882, served November 2, 1882, gave in five days, of same date, 71 quarts, an average of 14½ quarts per day; Vesta Third, born May 1, 1878, calved November 27, 1882, gave in five days, same date, 85 quarts, an average of 17 quarts a day.

Mrs. White, Roussaillerie Farm, states that two cows owned by her have given the following quantities of milk during the year in five months:

Red cow, six years of age, 2,482 quarts, record commencing July 1 and closing November 30; number of days' record, 153; average per day, 16½ quarts. Brown cow, eight years of age, 1,944 quarts; record during the same time, 153 days; average per day, 12½.

Milk record of a Guernsey cow.—An English breeder of the Guernsey gives the following particulars with regard to the cow No. 630, in the Royal Guernsey Agricultural Society's Herd-Book. She calved on 15th May last, and the record is from July 9 to 15. The cow was fed on clover only. The amount of butter made from the week's yield was 15 pounds 6 ounces:

Date.	Morning | Noon. | Night.			Total.
	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.
July 9	15 8	10 8	14 12	40 12
July 10	16 0	9 8	15 8	41 0
July 11	14 8	12 0	12 8	39 0
July 12	16 0	14 9	13 0	43 0
July 13	14 8	11 8	12 12	38 12
July 14	15 0	10 8	12 8	38 0
July 15	15 8	9 8	13 0	38 0
Total				275 8

Guernseys in the Isle of Wight.—The Rev. W. A. Glynn, of the Isle of Wight, the well-known English breeder, says:

My Guernseys are quite pure, and I generally carry about 30 to 40 head. I commenced with the breed twenty years ago. I register daily at each milking the quantity of milk each cow gives, the annual average yield being 650 gallons, or, taking a gallon as weighing 10½ pounds, 6,825 pounds; but some of the cows yield 800 to 900 gallons a year. Two gallons, or 21 pounds, of milk make 1 pound of butter. I never make cheese, nor have I weighed a live carcass, but the average weight without head, skin, and offal, is about 740 pounds.

The color of the Guernsey is lemon and white, and they arrive at maturity in about three years. The produce of my cows is all sold as milk in the yard to a dairyman at a shilling per gallon. The annual average return is about £32 10s, while the cost is £15. They have 4 pounds of decorticated cake daily through the year; from about May 1, to Christmas they run in the fields, and the rest of the year sleep in the open shed at night, and have 28 pounds of mangels and 12 pounds of hay if fresh, the milkers in winter receiving an additional 6 pounds of bran. During June, July, or August if the pastures are short they get vetches; from October to Christmas cabbage, and mangels from Christmas to May.

I have bred with a view to useful and good dairy stock, but last year exhibited with wonderful success the cow "Vesta," which was shown four times. I won the 1st twice; the 3d, once, and the reserve, besides being once very highly commended. With another, which was also shown four times, I won the 2d three times, and was very highly commended once; also the champion milking against 23 others once, and the first milking once. With my bulls I have also been very successful in obtaining honors. I started with the best blood I could get in Guernsey, and I carefully breed for produce in quality and quantity. The quality on analysis at the dairy show gave the specific gravity as 1.0316; total solids 11.25; fat, 5.54; solids not fat, 8.71; percentage of cream by volume, 7.5, and drew special remark from the analyst as being the richest specimen of milk.

I find that the stock raised here are far more hardy and do far better than when imported from Guernsey. I infinitely prefer them, and only resort as seldom as I can to fresh blood from Guernsey. I carefully select my breeding stock, and do not force them, but keep them in good order. I find no difficulty in finding purchasers, and as I receive many applications, I place them in a book to be entertained in rotation. Many gentlemen who have acted as judges of Channel Island stock at various shows come to my herd to purchase. Our soil is a medium loam, partly on gravel and partly on clay, much of which was recently laid down to pasture, but is not good for the production of milk. The climate is good, I may say more temperate than in most parts of England, the altitude being from 50 to 150 feet above the sea, near to which we are.

Record of a Guernsey herd in Sussex.—Mr. Nevill Wyatt, of Cuckfield, Sussex, who has taken such trouble with the Guernsey Herd-Book, says:

I farm 123 acres of poor soil, called the Weald of Sussex, and it is the queerest mixture of clay, sand, and gravel, as sometimes in the same field where pure sand is quarried for building purposes there is found some 40 or 50 yards of stiff clay. The natural soak is bad, as the beds of clay bank back the water. The farm, however, now is all

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tile drained 3½ feet in depth, but the distances between the drains vary. The cow-house is situated on the north side of a hill, but so high that the sun shines on it all day, from the time it rises till it sets. The ridge upon which the farm is supposed to be the prettiest but coldest spot between London and Brighton. As the crow flies, I am about 12 miles from the sea, and, with a southwest gale, *salt* is often driven with it, and the windows thereby are streaked with the salt. I look on the Guernsey as a better animal all round than the Jersey. It is hardier, and I have only lost one, and that through cancer, which it had in the heart. The Guernsey gives more milk, and it is equally rich, and when done with sells for more to the butcher. I sold at open market, where Sussex and Shorthorns are the usual run of beast, a five-year-old Guernsey, which slipped her calf a fortnight before, for £18.5s. Jerseys in that case fetch from £5 to £9. I have sold others at £15 to £18. They do not fatten easily, but they always cut up far better than they look; in fact, where a Shorthorn looks fat *outside*, a Guernsey is fat *inside*.

My cattle are all housed in a large, well-ventilated cow-shed from October or November, according to weather, till there is a good bite of grass in the spring. On grass they get per day each about 1 pound of decorticated cotton cake. The yearlings run out all winter, but have a shed where they can go to, and in winter-time they get for food cut straw, and from 1½ to 2 pounds of linseed cake and lucist beans in equal proportions.

The cows are fed 3 times a day. In the morning and evening they receive each hay and straw (oat) chaffed with pulped roots, all steamed, with 1 pound of middlings and 1 pound of maize meal mixed with it, and in the middle of the day they get hay and straw chaff with pulped roots, not steamed. In addition I give them, according to the milk they are giving, from 1 to 4 pounds of cake a day, ½ of decorticated cake and ½ linseed, heifers with their first calf only having linseed. I test the milk from time to time, and the average of cream is about 15 per cent.; the lowest, and which only one cow gave, being 13 per cent., whilst the highest was 18 per cent.; but 15 per cent. I calculate is a fair average. I calve my heifers down at any time from 21 months.

The fault I find with Guernseys is in their bony and angular rump and shortness from hip bones to tail. I am trying to improve this, but find it difficult to get bulls to please me. In addition, a great many have the tail sticking up too high. These things are what make a Guernsey *look* so thin, and it is hard to cover these angularities with flesh. I am in hopes, however, that I shall speedily improve these points, as I have a very good bull of my own breeding, and I shall put him to his own daughters and with their progeny breed out again. I only once tried a test with regard to butter, and that with *not* nearly my best cow. She had calved 6 weeks before, and had just returned from a show and was not milking well, but I wanted to make a rough guess at what a Guernsey could do. She made 9½ pounds of butter in 7 days from 8½ quarts of milk. I have only known of one steer being fattened, but he made a nice beast, and was sold when 3½ years old, in the beginning of December, 1881. He realized £23, and as butchers around here are very prejudiced, and will only look at Sussex and Shorthorns, I did not consider it a bad price.

The following are particulars of my herd as submitted:

(Production by quarts.)

Name.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Rosbud, 1881 (aged).....	229	191	181	183	192	161	87	28	..	..	..	..	Quarts 2,481
Rosbud, 1882.....	300	259	224	197	173	161	153	..	..	305	411	368	2,620
Bekkie, heifer.....	255	172	166	191	170	128	..	..	..	..	..	..	1,376
Topsey, aged.....	303	262	258	200	271	250	209	118	77	17 (dry)	..	..	2,000
Sunbeam, 2d calf.....	..	..	300	386	353	271	260	222	157	52	..	..	2,064
Sunbeam, 3d calf.....	123	417	377	268	255	268	250	219	185	135	81	17	2,660
Rosbud, 2d calf.....	..	126	..	384	342	286	201	225	183	133	64	12	2,010
Dean, 3d calf.....	144	125	128	211	382	436	345	284	245	192	171	115	2,767
Valentine, 1st calf.....	144	125	129	..	117	1292	214	163	140	146	147	..	1,536
Golden Leaf, 1st calf.....	..	8	350	256	179	148	128	87	51	..	..	..	1,210
Changeburg, 1st calf.....	..	..	14	261	279	248	183	133	144	..	..	..	1,220
Gift heifer, 1st calf.....	..	..	..	..	..	..	..	..	..	..	..	..	1,444
Bad'll's daughter, heifer.....	..	..	..	..	65	300	287	222	180	143	123	121	1,391
Fortune, heifer.....	..	..	..	..	..	..	..	..	..	..	..	..	1,210
Mimo, heifer.....	..	..	..	..	..	..	..	..	..	..	..	..	1,210
Greenbury, heifer.....	..	..	..	..	..	..	..	..	..	..	..	..	1,210
Thorne Pie, heifer.....	..	..	..	..	..	..	..	..	..	..	..	..	1,210

*15 quarts. 113 quarts a day, 79½ quarts a day, 51½ quarts a day, 110 quarts a day.

Notes on Guernsey cattle by a Guernsey farmer.—Mr. James James, of Guernsey, another breeder of considerable notoriety, sends the following remarks upon them:

There can be no more practical question connected with land than that which has reference to the value of the different breeds of cattle peculiar to the British isles. They may be classified under two heads: the beef producers, and those more especially adapted for the production of milk. To this latter class my remarks have special reference. Probably in no one breed shall we find these two qualifications more fully combined than we do in that which is peculiar to the island of Guernsey. This and the sister island of Jersey form two of the group known as the Channel Islands. They have each a breed peculiar to themselves, which differ widely in many essential points. The Guernsey is the larger of the two and very similar to that bred in Alderney, another of the islands composing the Channel Islands group.

The Jerseys for a long time have been designated as Alderneys, but for what reason I am unable to explain. This latter island is under the same government as Guernsey, has similar laws, and enjoys the same privileges. It is not so, however, with Jersey, for in this island the government differs. No admixture of the Guernsey and Jersey breeds is permitted. From almost time immemorial the Guernsey cattle have been jealously guarded; stringent laws have been passed, prohibiting the importation of any foreign cattle for breeding purposes, and notwithstanding the various attempts made to repeal them, the royal court of the island has always confirmed and strengthened its former prohibitions. Thus under no circumstances whatever can there be any admixture of foreign blood, and the farmer can consequently boast of a breed of cattle eminently pure and distinct, beautiful in appearance, and surpassed by no other in its distinguishing characteristic. As regards its original habitat, opinions differ very widely; we may, however, reasonably infer that it had its origin in some part of the French continent. It is a matter of history that the islands of Jersey and Guernsey, as far back as the sixth century, were united to the mainland by a single plank.

This breed of cattle has long been famed for its cream and butter producing qualities, and it is also eminently adapted for the shambles when, from age or other cause, these valuable properties fail to be profitable. They are exquisitely delicate in color in color varying from light-red to lemon and orange-fawn, occasionally black, almost all having a considerable admixture of white. In individual cases it is black, encircled with light-colored hair.

The most approved points of a Guernsey may be considered to be as follows: Head small but long; eye bright, lively, but placid; horns small and well turned upwards, being fine, yellow, and waxy at the bases; ears small and thin, with fine thin hair and a deep golden color inside; nostrils open; neck long and slender, tapering towards the head; shoulders thin; forequarters light; limbs delicate; back straight and broad behind; tail fine and thin, set on at right-angles with the back; hide thin and mellow to touch; carcass deep and well let down; hindquarters full and large; udder capacious, broad, and square, well in line with belly and stretching well forward, not fleshy, silky with fine downy hair; milk veins very large and prominent; teats large and strutting outwards and well apart; the general figure compact, wedge shaped; skin tinged with a deep orange-yellow throughout, especially marked inside the pastern joint. To these essential points may be added those tests as shown by the Guenon theory, and which when properly understood and applied are most valuable as indicative of milk-producing properties.

The opinion of the Guernsey farmer is much divided as to what may be considered the most approved points of the male animal. Some prefer the bull which possesses many of the points as approved in the female; others, those of the more masculine type. Since the superiority of the Guernsey cow for dairy purposes is so generally admitted, we must not, I think, be guided so much in our selection by what may be the approved points of excellence in the individual animal as by a knowledge of his parentage, and this knowledge becomes of still more importance when we consider that the male undoubtedly acts the principal part in impressing his character upon the offspring.

Of late years there has been a very marked improvement in the cattle throughout the island. The breeder has become more alive to the value of his cattle, and, stimulated by a very large and increasing demand both from England and abroad, has devoted increased care and attention to the breeding and rearing of his stock. Where careful and intelligent breeding has been pursued, selecting fitting sires and dams, a very marked and increasing excellency has been stamped upon the progeny. Earlier maturity, increase of size, a more fully developed lacteal system, and a stronger constitution have been the result, and with perseverance in such a course these essentials will become intensified.

Two herd-books have been established, one on the principle of selection and the other in the form of a register, admitting within its pages all cattle to the island

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Great difficulties must be experienced by breeders and purchasers whilst these two registers are at variance with one another; instead of affording information and assistance, confusion and perplexity must be encountered. As a guide to selecting sires and dams a general register will meet every requirement; the breeder will be enabled to trace the parentage of any animal he may require, and to form his own judgment as to its individual merits.

The Guernsey being essentially a dairy breed of cattle, it behoves the island farmer to devote still more attention to the actual yield of milk and butter by the individual members of his herd. Experiments and trials tending to elucidate this matter have been meager in the extreme, and it is only in a very few cases that I have been able to obtain reliable information upon the subject. On some of the best land in the island a number of animals are still reared which are a discredit to those concerned. At our annual fairs or markets the number of animals exhibited for sale are proportionately small. The cause why good and desirable stock is scarce is partly to be attributed to this and partly to the lack of knowledge of good breeding.

Too little attention has hitherto been given to the use of good bulls; animals born from indolent parents, and not possessing a single desirable quality, have been coupled, very much to the detriment of the offspring. A good bull may be used, but the farmer makes the mistake of employing inferior females. The bull being capable of transmitting to his progeny his own peculiar properties, and whatever excellencies he may have inherited from his ancestors becoming marked in it, it will become necessary for the breeder who seeks to improve his stock to be careful to make a choice of such animals whose parents have been endowed with those characteristic qualities, and which he seeks to intensify in the offspring. The form, character, and development of the lacteal system of the females is no less important, and if it is hoped to arrive at success in breeding one must follow out in practice these essential principles of breeding. By thus selecting our breeding stock, and by a careful and generous system of rearing the offspring, a very great and marked improvement in this valuable breed of dairy cattle will be the result.

(9) KERRY CATTLE.

The animal represented in the accompanying engraving was, with seven picked heifers, selected from the celebrated herd of the Knight of Kerry last spring. Like his companions, he is jet black, the color of the purest strain. His height at shoulder is 3 feet 6½ inches; his girth at same point, 5 feet 7 inches. He carries bulk for his size, with shape and symmetry, and stands a perfect picture, a model bull in miniature, showing all the recognized bovine points in strong development, with some that are peculiar to himself.

The qualities of the Kerry are as follows: (1) head rather small, balanced, and tapering; (2) cheeks clean; (3) throat full and well set; (4) muzzle fine; (5) nostrils high, well placed, and rather open; (6) horns well sprung, smooth, rather thick at base, but gently tapering, and tipped with black; (7) ears small, fine, and of a pink orange color within; (8) eyes mild and full; (9) neck straight and fine; (10) chest deep and broad; (11) barrel deep and well hooped; (12) ribs well home; (13) back even and straight from withers to top of hip; (14) neck straight from top of hips to setting of tail; (15) tail long and fine; (16) hide of good color, slight, loose, and covered with soft hair; (17) fore leg short and straight, full above the knee, fine below; (18) hind-quarters well filled up; (19) hind legs not too close together and squarely placed; (20) hoofs small; (21) udder well rounded, full and capacious, in line with belly and well up behind; (22) teats well placed, large, and rather far apart; (23) milk veins very prominent; (24) color, jet black preferable, although there are some very good animals of other colors.

Although of very small size, the cows yield a large quantity of milk, rich in cream; they fatten fairly easily upon even poor pasture, and are certainly superior to all other breeds for hardiness and the power of subsisting upon the scantiest herbage. Mr. Pierce Mahony says:

I have now a good number, but most of them are heifers with their first calf. Notwithstanding this, many of them are giving from eight to ten quarts of milk a day.

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each, but it is in the quality of the milk that they specially excel. I have not as yet tested the milk of all, but among those tried I have found many to give 10 per cent., 11 per cent., 12 per cent., and 13 per cent. of cream, while one has gone as high as 15 per cent. This, with an average live weight of from six to seven cwt., is, I think, a satisfactory result. An imported Alderley, after her fourth or fifth calf, on the same pasture, is only giving seven quarts of milk, containing 12 per cent. of cream. The pure Kerry is a graceful animal, with finely formed limbs and a grand constitution, capable, I believe, of great development on good land.

Mr. Richard Barter, an extensive farmer, breeder, and dairy-owner, says:

Having a large dairy, with a few pure Jerseys, and always 7 or 8 Kerries through the stock, I can bear testimony to the great value of the Kerry as a cow, in proportion to her size, and the amount and quality of food she consumes. Her points are the following: She yields a large quantity of rich milk, is extremely hardy, is easily kept, is, moreover, docile, easily fattened when done milking, and is moderate in price. I know of no cow which is so suited to families where only two or three are kept, or for light, upland pastures. I have a large upland farm entirely stocked with them.

Mr. A. J. Knight, in the following fact, supplies, in all likelihood, the reason which led him to from his herd:

Last year I had a Kerry cow given me, sent over from Kerry, where she had been much admired as a perfect specimen. This cow beat two valuable and lately imported Guernseys here, giving a larger quantity of equally rich milk; and, whereas the Guernseys looked poor and miserable during the winter, the Kerry was always in good condition and happy. All had a mixture, in equal quantities, of best oil and cotton cake, at the rate of 5 pounds of the mixture to each cow per day.

Professor Baldwin, the well-known Irish agriculturist, bears this testimony:

The Kerry is small in size, exceedingly hardy, and can subsist on poor and exposed pasture. It often bears a close resemblance in size, shape, and color to the native cattle of Wales and Brittany. The color preferred is black, with a ridge of white along the spine, and a white streak along the belly. Cattle of true Kerry descent are met with of other colors. Thus, I have seen them brown, black, and white, and black and brown. The horns are fine, somewhat long, and turned upwards at the points. The skin is soft, unctuous, and of a fine orange tone, which is visible about the eyes, the ears, and the muzzle. The beef is tender, well marbled, and commands the highest price in the market. The milk is peculiarly rich and well flavored, and the quantity of it yielded, even on hard fare, is so great that the Kerry has been styled the poor man's cow. Professor Low observes, that in milking properties, the Kerry cow, taking size into account, is equal or superior to any in the British Islands.

Mr. James Robertson observes:

As Youatt says, the Kerry may be truly described as the poor man's cow, living everywhere, and the description is thoroughly accurate. The Kerry will live and thrive in almost any climate and temperature, on the site or summit of a Kerry Mountain or in the poor undrain'd lands of the lowlands. I have made no extended experiments and am unaware of any having been made, but my experience of an average Kerry cow is that she will yield on an average 12 quarts of milk per day, and 10 to 11 quarts of milk will produce 1 pound of butter. Cheese-making is almost unknown in Ireland. The weight of the animals when fat is from 30 to 35 stone, of 8 pounds, and they frequently run up to 40 stone. My herd is kept on prime old pasture, which has been most judiciously "laid down," but the part the Kerry plays prominently in the agriculture of the country, is that they are bred by small farmers in the Kerry Mountains, where they have a temperature and climate much resembling that of the Welsh Mountains, and are kept in and about that district until they are from two and a half to three years old, when they are bought up in the local fairs in Kerry, and elsewhere for the richer lands of surrounding districts: in fact, the popular idea is that if lands not good enough to fatten Short-horn cattle, it will be occupied by Kerries.

Considering the neglect with which the Kerry have been treated, no method whatever being followed by their breeding, it is a wonder they are not extinct long ago. They are very easily kept. Two will consume very little more food than one large Short-horn, and when crossed with it make both good dairy cows and butcher's beasts. My champion bull, Busaco, who has never been beaten in a show-yard and who obtained ten royal prizes (the one at Kilburn included), measured 68 inches in girth, 36 inches in height, and 31 inches from tail to top of shoulder. The Kerry cattle are extremely hardy, not liable to disease, are handsome, docile, pretty in the park

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or paddock, and excellent butter-makers. My cattle are never housed, cows in milk excepted, and they seldom get anything but grass and straw in winter. The points of the Kerry are, a small, neat, lively animal, light round frame, narrow rumps, fine bone, limbs rather long, fine small head, keen eye, white upstanding horns, with black tips. The popular color is jet black, but a few red and brindled ones sometimes appear.

We are indebted to Mr. R. O. Pringle, late editor of the *Irish Farmers' Gazette*, for the following:

The Kerry cow is a neat, light-made animal, with fine and rather long limbs, fine small head, lively eye, fine white horn, which in many cases after projecting forward is turned or cocked backward. The rump is narrow, and the thigh light. The fashionable color is pure black throughout, but some are black and white, and others red. The skin should have a mellow touch, and be well coated with hair. The Dexter variety is distinguished from the pure or true Kerry in having a round plump body, short and rather thick legs; the head is heavier, and wanting in that fineness which marks the true Kerry, and the horns are longer, straighter, and coarser. The real origin of the Dexter variety is not well understood, but it is supposed to be the result of special selection. In Ireland the Kerry is much esteemed as suitable for small villa farms, as the cows, although naturally active, are very gentle, and do well when tethered on confined bits of grass. They also thrive when kept constantly house-fed. We have known a Kerry cow to be kept for five years in a dark stable in Dublin without injury to her health. About 12 quarts of milk daily is an average yield for a Kerry cow when she is fairly kept [this is too much.—T. L.], and we have known some cows to give as much as 16 quarts daily for a considerable time after calving. The yield of butter is 1 pound from 11 quarts of milk, but we have known a higher percentage of butter obtained.

Kerry can fatten rapidly when required. This is true when they have been kept as cows or otherwise, for a time on fair pasture, but poor Keries, especially bullocks, when obtained direct from their native mountain grazings, take some time before they begin to show improvement. When once they do begin to improve, their progress is rapid, and when slaughtered their flesh is of the best quality, fine in the grain and richly flavored. Their weight, when fat, is from 28 to 36 imperial stone. Extra-fed beasts will make 40 stone. With a few exceptions, the breeders of Kerry cattle have not much recently devoted much attention to the proper maintenance of the breed, and the fact that Kerry cattle have survived the neglect with which they have been treated, without material deterioration, is strongly in their favor. The Knight of Kerry has a herd of Kerry cattle which has been bred with great care for a long period, and other gentlemen in that part of Ireland have also devoted attention to the subject, but the reputation of the breed has been considerably enhanced by the interest which has been taken in it by various gentlemen residing in other parts of Ireland, who have taken up the breeding of Kerry cattle, not merely as a fancy, but from the intrinsic merits of the breed as dairy stock.

Mr. P. Chesney, in giving the results of very careful observation during his experience of the Kerry, says:

My cows were kept on the same farm and fed on the same pastures as a number of Ayrshires, Shorthorns, and common cows, the only difference in their treatment being that the large animals used to receive supplementary allowances of bean-meal, cake, and other dainties which were found at times to be necessary for them. I do not speak from memory as to the facts I am giving, having before me a register of the quantity of milk given by each of my cows, at that time 38 in number, during the months of one spring and summer, as also of the percentage of cream as tested by the lactometer. I should observe, however, that the milk was only measured and tested once a week.

The farm on which the cows were kept, situated in county Cork, consisted of some 200 acres of by no means exceptionally good land, part of it indeed mountain, and other parts reclaimed bog, laid down in artificial grasses. Of course some fields were devoted to mowing, and we had considerable facilities for investigation, while others produced grain and root crops, more of the latter, however, than the former. One kind of forage found especially useful, particularly for young stock, was French fenz, which turned a piece of rough, stony ground into quite a profitable place.

Up to the time of my going to the farm it had not been the custom to keep much cattle there, and the cows, although good ones, were of no particular breed. But as butter fetched a good price, especially when carefully made, and dairying was more profitable in that locality than other kinds of husbandry, the stock was soon largely increased, and Ayrshires and Shorthorns introduced. At one time we in fact had as many as 60 milkers besides a considerable number of calves and heifers. Having a

strong suspicion, however, contrary to the views of our neighbors, that the little black cows of the adjoining county would prove quite as serviceable and much more economical in our circumstances than the larger breeds, it was resolved to give them a fair trial, and as we decided to start with good ones we made an expedition to Valentia and after inspecting the herd of the Knight of Kerry, became the owners of several good specimens of his prize taking stock. But as these of course fetched somewhat higher prices, we also made some purchases from the farmers about, in particular that of one little heifer which became quite a celebrity. It was in autumn that we made our ventures, and our little favorites having been carefully driven home and well housed and attended to during the winter, duly calved the ensuing year, with the exception of one of those bought from the Knight, which turned out a strippel, almost all of them being three or four year old heifers, and this their first time of calving.

Besides these pure Kerries we also bought 3 half-breds, the result of the cross between the Kerry and the Shorthorn which Mr. Mahony so strongly condemns, and I am bound to say that better milkers for their size it would be difficult to find. One of them, moreover, was quite a beauty and chosen on this account by an excellent judge who had some difficulty in persuading her owner to part with her, and I believe that a "first cross" between Kerry and Shorthorn parents, possessing the requisite qualifications, produces a very useful animal for a dairy farm, especially if it be one where the yield of grass is not very heavy, or where there is mountain grazing; for these cows not only give plenty of milk up to an advanced age, but fatten more readily and produce a larger amount of meat than the pure Kerry whenever it may be necessary to get them ready for the butcher.

The young Kerries, three or four year olds, with their first calf, did not (any of them) milk more than $7\frac{1}{2}$ quarts in the day the first year, but those which were two years older gave 12 and 13 quarts, and even as much as 18 quarts soon after calving. A four-year-old half-bred, however, gave $10\frac{1}{2}$ quarts. Now, as our best Ayrshires, large, heavy cows, which consumed a great deal more fodder than the Kerries, never gave a greater yield than 15 quarts and our heaviest milker among the Shorthorns never quite reached 20 quarts, even when receiving bean-meal mashes, &c., in addition to vetches and grass, I consider that the Kerries are decidedly the most profitable, particularly as they are industrious little creatures, wandering off to find food for themselves, and always contriving, if they meet with any fair treatment, to keep themselves in proper condition.

A pure bred Kerry, too, with her sleek, shon coat and gracefully-shaped waxy horns, is a very pretty creature, and may almost challenge competition with her beautiful dove-colored sisters of the Pyrenees, though I doubt whether she would willingly suffer herself, as they do, to be trained to servile employments, and made either to plow and furrow or draw a cart of hay. Nor would it, in point of fact, be at all profitable to employ cow in this manner if we wanted them to give plenty of milk. Whether in years to come, peasant farmers may find it economical to use cows in that way is another matter. For my part, I believe that jennets, especially in Ireland, are better substitutes for the more expensive equine animal.

As to the cream-producing qualities of my cows, I rated Shorthorns to give the lowest and common cows the highest percent age, Kerries and half bred Kerries being second best, and Ayrshires next to them in this respect. It is needless to allude to a fact which every observant person who has to deal with cows will have noticed, that the yield of cream often varies considerably with the same animal from one week to another, and that from no appreciable cause, when no detraction has been made in the feeding, and there has been nothing, so far as one could see, in the state of the cow herself to account for it. Of course, too, the creamometer is only a test of the quantity and not of the quality of the cream, and I had no other way of judging of the latter, save by its apparent richness or otherwise, which I used to note down.

Taking, then, these notes for what they may be worth, I find that with one exception, that of a seven-year-old cow, the cream from my Ayrshires was remarkably poor, that of the Shorthorns little better, that of the Kerries took the next place, and that the common cows gave the richest milk of all; but I am bound to say that the latter were almost all aged, and none of them less than 5 years old, and I have always found the milk of old cows much richer than that of young ones, although the contrary opinion is, I believe, more generally held. It would be interesting to know what is the value of the milk of the Kerry cow as compared with that of the Alderney or the Jersey. I imagine that on very good pasture the Channel Islands' cattle would bear off the palm, but that on poorer or on no pasture at all the Kerry would win the day.

As to Dexter's I am pronounced in opinion. I think, indeed, a pair of these tiny creatures more useful than all the rest. They are certainly small, but have no pretensions to beauty. The Kerry, under better management, is a good deal more certainly worth the trouble to which, made to her of necessity, she is subjected herself transplanted. She was one of three purchased at Valentia, and owned by

selection entirely to her remarkable appearance. Looking out of the window at my hotel one morning I saw a collection of animals which had been brought together for the inspection of the gentleman, who, it was to be hoped, would be soft enough to buy up anything that was presented to him as a "rile Kerry," and singled out from the group, and as it seemed in the act of being purchased, was so queer a specimen, that, running down stairs in alarm, and appearing on the scene of action, I began to remonstrate against the transaction. My protest, however, availed not. Cockle, as she was soon appropriately named from having been bought by the sea-shore, was selected for her oddity, and sent home with the rest, being not much to speak of as to body, but the owner of a long pair of wide spreading horns that might almost have graced the head of a Spanish cow. Needless to remark, she was received by the cow-herd with little favor, and barely tolerated about the place as "master's fancy." By-and-by heavy trouble coming down upon the occupier of that farm, a change of residence was resolved upon and most of the live stock sold; but a mere nothing being offered for Cockle when she came to the hammer, she was bought in and removed, as I before said, to the north, where, after producing her second calf, the despised Kerry proved so excellent a milker, giving 20 quarts at first, and never, I believe, going below 12 or 14 until just running dry—her butter also being very rich and plentiful—that her reputation became so great as to cause her progeny to be in great request.

This of course was all mere chance. With Kerries, as with all other live stock, the great thing is to choose well and continue to breed from the best subjects. The breed is capable of great development upon good land, for we have seen at Irish cattle shows, Kerry cows very little, if at all, smaller than good-sized Ayrshires; such, for example, as some of those bred by Mr. Brady near to Dublin, and as the merit of the Kerry is considered by connoisseurs to be particularly good, it may not be undesirable to take size into consideration, although this is a point that I personally should care little about. A really good herd of Kerries would be found, if I mistake not, in more ways than one, a profitable investment.

The first cross, however, between a Kerry and Shorthorn is not suitable for a severe mountain climate and poor pasture. The more Shorthorn blood that is introduced the better the cattle must be cared for, whereas, if the better care be bestowed on the Kerry breed the results will be more satisfactory for dairy purposes, and ultimately quite as good as regards increased size. The following are the results of some experiments carried out on the British Government's model farm at Kingwilliamstown, and will be read with interest. The elevation of the farm is about 800 feet, the pasture fine, the situation exposed, and the climate moist. The experiments were conducted for the purpose of ascertaining the relative value of Galloway, Ayrshire, and Kerry cattle for dairy purposes. The conditions, however, were not quite equal, inasmuch as the Kerry and Galloway cattle were heifers with their first calf, whereas the Ayrshire were with their fourth calf. The cows were all wintered on the farm, and from the published report it would appear they had nothing but hay. The quantity consumed by each breed was carefully noted. Each Galloway consumed 24½ pounds a day, each Ayrshire 24½ pounds a day, and each Kerry, 16½ pounds a day. From this it would seem that the Kerry is easier fed than most breeds of cattle, and this assumption is supported by the opinion of those most conversant with the breed.

As regards the relative size of the breeds the report states that the Galloway cattle when fat would make about 6 cwt., the Ayrshire 5 cwt. to 5½ cwt., and the Kerry 4 cwt. The milk was measured and manipulated separately from the time of calving to the 17th of June, and as regards quantity, with the following result: Each Galloway cow gave average of 6½ quarts a day; each Ayrshire gave an average of 9 quarts a day; and each Kerry gave an average of 7½ quarts a day; the Kerry and Galloway giving these quantities after their first calf, and the Ayrshire after their fourth calf. The same Ayrshire cows, three years earlier, after having had their first calf, gave only 7½ quart a day each; that is, only half pint more than the Kerry cows under the same conditions; so

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the first and at the time the only native breed of stock in Scotland which the National Agricultural Society distinctively recognized for encouragement as breeding stock by the offer of premiums for such at that society's first general show at Glasgow in the year 1826. Originating in dairy districts, they have been almost exclusively bred for dairy purposes, but statistics show what perfection the breed might attain for the purposes of the butcher.

In the counties of Ayr, Renfrew, Wigtown, Lanark, Sterling, Dumbar-ton, Bute, Argyle, Dumfries, Kirkcubright, and Perth they form the only class of dairy stock, but they are sought after earnestly by dairy men in all the other counties of Scotland, throughout England, and now Mr. Ferme has established a large and eminently successful dairy of them in the very midst of South London. They are annually exported in large numbers to Sweden, Australia, New Zealand, America, and other countries. The dairies of them in Scotland range in numbers from 15 to 100, but now Mr. Hoggan has formed one of 300 at Busby, 6 miles from Glasgow.

Color.—The prevailing color is brown and white, spotted, flecked, or mixed with white, but inclining, as a rule, mostly to the brown. Many breeders incline to the pure dark brown without any white. In the showing in recent years the fashionable and stylish color has been pure white, with splashes of brown on body, brown neck, brown on the sides of the head, and white face. Breeders aim at fine, thin-skinned animals, soft and mellow to the touch, with nice, long, silken hair; and in obtaining these ends it has, in my opinion, been most justly conceived that white-haired animals are most prone to these qualities. I think the prettiest specimens of the breed and the best types are to be found in those whose bodies are dark brown and have pure white hind legs, white udders, and white tail. These sorts, in my experience, have proved the best milkers and surest fatteners. Very few dairies there are which have not a black and white specimen of the breed. That color is not rare, and they are always found good milkers.

Characteristics.—In my opinion the following constitute the leading points in the Ayrshires: Large nostrils; short head, from eyes down-wards; large, full, and lustrous eyes, set well forward in head; broad brow betwixt eyes, gradually widening upwards to its full breadth be-twixt the horn roots; horns widely set apart and inclining entirely up-wards, and white with black points; horns of bull not so highly set and of fair thickness; neck, at the back of the horns, level, and extending straight back to shoulder-bone, the back continuing in a straight line to tail root; no dewlap; body round heart-line extending in a gradu-ally deepening line to the flank; shoulder-bone high and thin, rising above the blades, the blades being well set and not working when the animal is in motion; part of body behind shoulder level; back broad; teats broad and pointed and equidistant betwixt second fore rib and and tail root; ribs well sprung from backbone downwards; calving bones by no means wide; tail well set in; deep, well-filled thighs, ex-tending in a straight line downwards and reclining low in the body at the flank; whole body set on short legs; long hair; soft, mellow skin; fine bones; whole contour level; body full of substance and symmetry; animal sprightly, with fine escutcheon, and showing nobility and gran-deur of gait; in cows the milk-vessel should be broad betwixt hind legs, well caught up to body, large and level on sole of vessel and ex-tending forward far on to belly; teats well and proportionately planted.

Maturity as milkers.—The Ayrshire cows are at full maturity by produc-ing a calf the month in which they reach three years of age, but many

breeders, however, choose to have their heifers in milk at two years of age. In my experience this retards the growth and full development of the animal, alike in size of carcass and milk-producing power, but not to any very great extent unless the heifer is kept too long a-milking. The commercial average value of calving cows, taken all the year round, as sold in markets and at public sales for dairy purposes is about £21. Such cows when done with at the dairy fatten well on grain alone and average in live weight $8\frac{1}{2}$ cwt. Cows destined for dairy purposes are never highly fed till they are in milk—grass alone in summer, and hay or straw alone in winter. It is considered that they thus develop their milk-vessels and milk properties much better.

Maturity as meat-producers.—Statistics show to what perfection the breed might attain if cultivated for purely fattening purposes. Mr. Lawrence Drew, of Merryton, lately exposed and sold a large number of calves, ten months old and then sucking their mothers, at from £18 to £25. I have sold in Paisley by public auction a two-year-old heifer to the butcher at £30. Two oxen of the breed exhibited some years ago by the Duke of Montrose gained the first prize at the national show as the best fat animals. They were aged, respectively, five and a half and four and a half years, and being of uncommon weight were sold to the butcher for £120. Two-year-old oxen of the breed fatten well on grass alone, without cake, and average 20 stone. Bulls reach their full growth at three years, and exhibit in a pre-eminent degree when fed all through these years the weight to which the breed might attain. The average live weight at that period from my experience is 16 cwt., dead weight 11 cwt. At five years of age I had one killed at York this year—winner in his class—live weight 19 cwt., dead weight 13 cwt. The bulk of bulls in this country are fed off and killed at two years and nine months. They average in dead weight 21 stones.

Housing and handling Ayrshires.—The breed is an exceptionally hardy one, so far as climate is concerned, for many, if not the majority, of breeders allow their calves and one-year-old heifers to lay out all winter, merely sheltered by natural plantations and receiving one sheaf of straw or hay each per day. For my part I find they do extremely well in this manner and start growing far earlier in the spring than those pampered in houses. All exhibitors of the breed contrive, although putting the animals under roof, to have them in open and exposed houses so that they may come out well haired. Bulls of all ages are generally kept in loose boxes, part of the box only being roofed. Calving and milch-cows are always kept in well-ventilated byres. The breed, as a whole, is an extremely easily handled and managed one, I might almost say of some intelligence. At milking time, either morning or evening, at the appointed hour you find the cows at the gate ready to be taken in, and even in a byre of some hundreds a cow after one week never mistakes her stall.

Feeding Ayrshires.—As I have said, young cattle are never better than when till two and one-half years of age they never see a halter, give them milk for two months as calves, then grass: in winter, one turn a day of hay or straw laid down on a clean bit of pasture, with probably the addition of some little oil-cake. For show purposes I find the best feeding is, for both morning and evening, cut bog hay steeped with brine and warm water, with one handful of bean meal, and in the middle of the day pulped turnips or oil-cake and bog hay. What we aim at is cold feeding. They should be given the very smallest quantity of meal and oil-cake, as they in my experience tend to put on flesh upon the neck, and thereby spoil the first point in the breed, viz. a thin neck. I have a year-old bull

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just now, or rather aged one year and a half. He won eight first prizes last year, including the royal, and covers six meal or oil-cake till January, 1884. His first show turn was at York on 11th April next. Milch cows in summer as a rule receive nothing but grass, but some very few give them a little bean or clover during time. In winter milch cows require turnips and bean meal is the most common.

Breeding Ayrshires.—The great aim of breeders has been to make for dairy purposes, and that is the object of the present show of body. We have been contriving to make milch cows past to great milk vessels irrespective of bodies. What we want is a broad milk vessel behind, well caught up to the body, and hanging on to the body and level sole, with teats not over large, well and evenly set on milk vessels, and having broad points. That is almost all which has been looked at for a long time, and really breeders have suffered considerably. Such animals have not as a rule commercial value. Many now see the folly and are breeding large, substantial bodies irrespective of milk vessel.

One consideration has militated against breeders being so successfully successful in producing perfective milk vessels in the fact that the animals are not in milk till three years of age, till in fact they have proved themselves, and then probably the bull is dead—some at least when might have been of incalculable service to the herd. Few keep their bulls, except for show purposes, over two years. Above that age breeders consider they are rather heavy for the cows, and leave calves which are sent on the cows. The bulk prefer stags to any other age for their cows. But my experience tells is wrong. The bull leaves the impression, and when one gets a good one keep to him. I had one five years old, and saw a three year old he bulled 80 cows and 80 as a two-year old and more. I had a four year old and no more living cows say he ever left a bad one, they was a true strain himself, and hence the result. His progeny have won the leading winners the last few years and will be this year again. We must and will now aim at breeding more for size and substance of body.

The Ayrshire as milkers.—We are not great statisticians, but the dairy show in London proves that for quantity and quality of milk the Ayrshire beats all breeds. Mr. Paine, from his Ayrshire dairy in South London, with 100 cows bought by and stock of Paisley, is now almost entirely the winner of the Lord Mayor's cup for the best dairy cow in the show. That prize is tested by quantity and quality. I have an average of a cow for two years in succession giving 11,100 pounds of milk per year, and of 12 little cows in the five grass months of summer giving 480 pounds of milk per day. I should say that in a fairly good dairy the average pounds of milk per year would be 10,000 pounds. I have tested cows in midsummer and found they gave 12 pounds per week of butter, and a fair average for the year would be 400 pounds, providing always that good grass in summer is given and good feeding in winter.

Near populous places many farmers sell their own milk and butter from the cart. They realize per cow about £21 per annum; and a bulk of the farmers in the district of Paisley let their cows for the year on lease. The party who takes them on a lease is called a "Boyer," and is supplied with grass for the cows in summer and food in winter. He milks the cow, supplies his own interests, horse and cart, and pays an average per annum per cow £18. As I have suggested, statistics are scarce, and exact data as to the quantities of milk required to make a



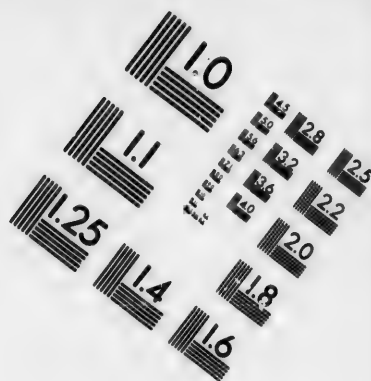
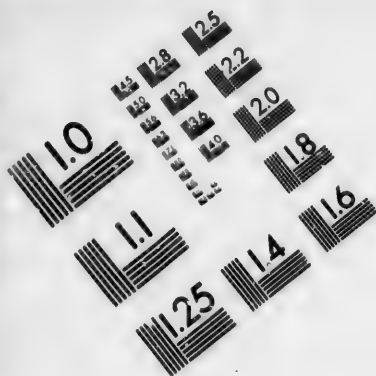
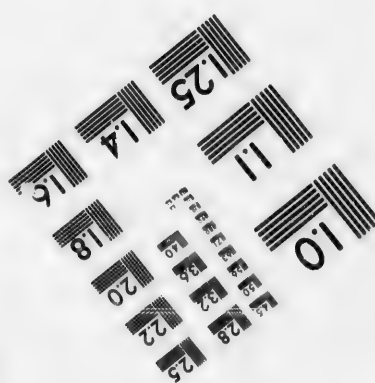
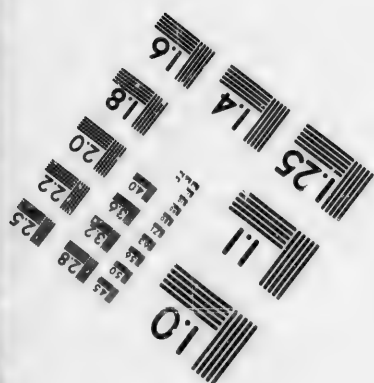
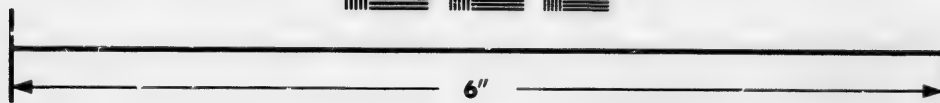
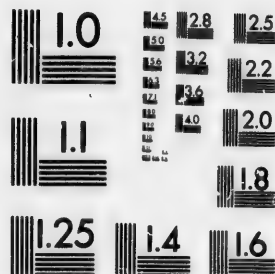


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pound of butter and a pound of cheese have probably not been recorded.

My dairy-woman, however, tells me that a fair average quantity of milk to 1 pound of butter would be 24 pounds, and this, too, in the summer months, when the cows get nothing but grass. From a given quantity of food the Ayrshire breed gives a greater quantity of butter than any other, giving more milk and retaining a far better condition of health.

I may also state that the very best-fattened Ayrshire steer shows a proportion of meat at maturity of 68 to 71 per cent. The Duke of Montrose's prize steers were said to exhibit 80 per cent. An Ayrshire steer is an extremely kindly feeder, and becomes at a period of from twenty-four to thirty-six months superior beef, if well kept throughout, with a live weight of 1,100 pounds to 1,250 pounds. A cow fattens quicker and to a greater degree of perfection than any of the rival breeds for the dairy. The soil in Ayrshire, where the breed was brought to perfection, is of a stiff, clayey nature, exhibiting throughout a substratum of limestone, coal, or iron-stone. Near the coast it is sandy. In Renfrewshire the soil is variable, some parts being of a light nature with a rocky bottom, and others being like that where the breed was perfected, of a stiff, clayey nature. The grasses chiefly cultivated—namely solely—are perennial: rye grass, timothy, and red clover.

The Ayrshire cattle have never, like some other breeds, been used for draft purposes. They are too beautiful and profitable to be applied to such purposes. A fact, and a scientific one, too, is that the milk of the Ayrshire is healthier and sounder than that of any other breed, while it keeps fresh for a longer period and is more easily digested.

Experience of Ayrshire breeders.—Mr. David Allan, M. R. C. V. S., who has had considerable experience among Scotch dairies, says:

A good Ayrshire cow will give annually about 750 gallons of milk, which will produce about 275 pounds of butter or 550 pounds of cheese. It, however, does not arrive at maturity for full milking until five years, although three years is reckoned to be the age. When at maturity at that age (three years), the live weight of a good heifer is about 11 cwt. and the dead weight of flesh about 5½ to 6 cwt., to which, in the case of a bull or ox, add a fifth. The soil is mostly of a light red marl on limestone or sandstone. The grasses that are cultivated are chiefly rye grass, timothy, and the different clovers. I do not know of any Ayrshires being used for the purposes of draft. The system of feeding these cattle is, cooked food in winter, such as chaff, turnips, bean meal, draft, and cabbage, and grass in summer for milch cows. Feeding stock have turnips and oil-cake along with hay. With regard to housing, the young cattle go loose, whilst the feeding and milch cows are tied up. We visited a dairy of 300 Ayrshires in Mr. Allan's district. The work was all done by girls. The milk is sent to Glasgow. The food is mixed in coppers and given hot in winter—grains, chaff, and roots. They yield about 10 quarts a head; breed tolerably well. The country is bleak and cold; soil heavy. Size and other particulars as shown above.

Another writer, in referring to the Ayrshire, says:

Ayrshire cows, from five to seven years old, which are full fed in town and suburban dairies, are almost invariably fat after being milked and fed from nine to twelve months. They, however, are not in such forward condition as Shorthorns would be under similar treatment, yet for the same quantity of food put through the bodies of a certain number of animals of a given value no breed will produce the same amount of milk as the Ayrshires. There is, however, this drawback, and it is agreed one from a town or suburban dairy-farmer's point of view, viz. that if the cows are bought at the calving and sold fat when dry, they seldom make as much as fat beasts as they did as calvers; whereas with the Shorthorn as much, if not more, is made. What money value, however, which the Ayrshire lacks as a butcher's beast it makes up in milk. Under all other circumstances where the cows are not sold as fat, after a year's use, but kept on for the dairy for a number of years, the position of matters is completely changed, for the loss which might be incurred between the buying price as a calver and the selling price as a fat beast is spread over several years instead of being borne by one.

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Julius Ben & Co. Lith.

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ENGLISHMAN, AT 18 MONTHS OLD.





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"PRIDE OF ABERDEEN" AT 4 YEARS OLD

Bred by James Watson, Esq., of Aberdeen, Scotland. Owned by James Watson, Esq., of Aberdeen, Scotland. Shown at the Glasgow Exhibition, 1874, and at the London Exhibition, 1873.

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The Ayrshire is, moreover, far more hardy and will thrive under circumstances where the Shorthorn would perish. This is well illustrated by the immense drafts of Ayrshires which have gone within the last few years to Sweden, Norway, and Finland, and from personal intercourse with natives of these countries I find their idea of the Shorthorn as a dairy cow is low compared with the Ayrshire. I annually pass a considerable number of both through my hands, and have come to the conclusion that the milking qualities are more regularly developed in the Ayrshire than the Shorthorn. Some Shorthorns are as good milkers as any Ayrshire could be, but they are extremely few, whereas it is the few Ayrshires that are not milkers and the many that are. Both breeds, however, I think, might be greatly improved as general dairy cows by judicious admixture of the good qualities of both. For milking and feeding I certainly prefer a cross by the Shorthorn bull with the Ayrshire cow to the pure breed of either, simply because it generally milks equal to the Ayrshire and better than the Shorthorn, and feeds equal to the Shorthorn and better than the Ayrshire. In carrying this out in practice, I generally buy Ayrshire cows and put them to a pure Shorthorn bull, keeping the cross female calves for my own stock and selling the males in the feeding districts, where they bring a price equal to that of any other. By this means I consider I make the most out of the good qualities of both.

(11) ABERDEEN OR ANGUS POLL.

Mr. Clement Stephenson, well known as a large prize taker, says :

Having for many years been engaged in a large veterinary practice, with special opportunities for forming an opinion on the merits of the different breeds of cattle from a professional point of view, and having for the last eleven years been a farmer and feeder of stock, I believe this breed of cattle stands pre-eminently forward both to the farmer and the butcher as being hardy and healthy, a good milker, both in quantity and quality, easily fed, a good beef producer, coming early to maturity, and highly prized by butchers.

Having devoted considerable attention to feeding cattle, both for market and show purposes, I was often struck with the excellent specimens of the Aberdeen cattle I saw, and I resolved to give them a trial. In the spring of 1877 I bought a young heifer of the breed in Buchan, Aberdeenshire, and, although only in ordinary condition when purchased, she improved so rapidly that, at Newcastle fat stock show, December, 1877, she took first prize in a class for heifers of any age; and, at the Smithfield show, 1878, she obtained first prize in a class for heifers of any age; and, at the Smithfield camp, 1878, she obtained first prize in her class and was reserve number for the Scotch two-yearling Polled steers from Mr. Bruce, Mid Clova, and with one of these sent out to show on November 14, 1881, when only two years eight months and nine days old, weighing 192 cwt., I gained first prize at Norwich; first at Leeds; second at Birmingham, in class for steers not exceeding four years of age; and second at Bir- to Sir W. G. Cumming's champion ox. With the other steer, I obtained first at York and second at Hull. The progress these pure Polls made in weight and the high price they sold for, in comparison with specimens of other breeds I was feeding and showing, convinced me that they possessed all the good qualities the late Mr. McCombie claimed for the breed.

In my first season, when I had pedigree Polled cows, I was much struck with their aptitude to fatten. They were grazing in the same fields with other well-bred colored cows, all were suckling calves, and while the blacks were full of flesh and in splendid condition their fellows were so lean that I had to instruct my bailiff to give them a liberal supply of cake. The more I see of this breed of cattle the more I am convinced of their great value. They are, it is well known, able to live and look well on a poorer class of land than many other breeds, and yet they repay, in a very marked degree, any attention they may receive either by putting them on good land or giving them extra feeding.

There is another and most valuable advantage these cattle possess, namely, their remarkable freedom from tubercular disease—a disease that has caused great loss and made sad havoc in many a herd, and a disease, the importance of which in a medical point of view (viz, its communicability to man), is now attracting much attention. Of course I cannot assert that it has never been known or seen in this breed of cattle; but this I can say, that although I have had special opportunities for research, and have examined great numbers of cattle, both alive and *post mortem*, I have never yet seen a trace of it in this breed.

Mr. Lyell, of Dundee, says :

The now celebrated Polled, or Hornless, cattle of Forfarshire, long familiarly known as Angus Duddies, were probably originally introduced into Scotland from Norway. They were formerly known in the neighborhood of Dundee as Humble Cattle, a name

synonymous with that used in Aberdeenshire, where a somewhat similar breed were called Buean Humlies. According to Mr. Bernt Petterson, Norwegian consul at Dundee, Polled cattle are very common in the southern parts of Norway, while in Tronso, within the Arctic Circle, they also exist in considerable numbers, as I have been informed by Mr. John Neish, who was there in 1879.

Iceland has also a breed of Polled cattle, noticed by Dr. Uno Von Troil in 1772. He said that in his time the country was well provided with cattle, which were generally without horns, and that their bees were not large but very fat and good. It had then been reported by some, though without foundation, that there were none of them with horns, but it was more true to say that such were seldom kept. Mr. Neish, who was in Iceland in the summer of 1881, says that the cattle there still agree with this description. It is reasonable to suppose that both the Icelandic and Scotch breeds were originally derived from the Norwegian; but, on the other hand, it cannot be denied that the same natural law of variation that produced hornless cattle in Norway, or where the Norwegian breed originated, could act on any breed. In addition to the Angus and Buchan Polls, now to some extent intermixed in all the best herds, there are two other British breeds of Polled cattle, viz. the Galloway, in the south of Scotland, and the Norfolk and Suffolk Red Polls. The Galloway had enough resemblance to the Angus breed to have been included with it in the early volumes of the Polled Herd-Book, but each has now a herd-book of its own. The Norfolk and Suffolk breed is said to have originated chiefly from a mixture of Scotch Polls with the Old Horned breed of cattle of these counties.

Coming to historical evidence of cattle breeding in Angus, the earliest I know of is that contained in Ochterlony's description of the shire in 1684-85. He says:

"Great abundance of cattle, sheep, and horses, especially the brae (hill) country, who have great breeds of cattle; and in all the laigh (low) country for the most part, except in some few places where they are short of grass, all breed as many as sufficiently serve themselves, but the chief breeds in the shire are the Earls of Strathmore, Southesk, Panmure, and Edzell, Powrie, Balnamoone, both for horses and cattle."

"Both these parishes, Kinnaird and Farnell, belong entirely to the Earl of Southesk, wherein are an excellent breed of horse, cattle, and sheep."

And, when writing of the Earl of Panmure, he says:

"He hath at Panmure a most excellent breed of horse and cattle."

Thus there is evidence that cattle were carefully bred in Angus two hundred years ago, and although it cannot be ascertained from any record at my disposal that these excellent breeds were polled or dodded, it is probable from the sequel that they were so; at least, those who have asserted that no particular attention was given to cattle breeding in Angus before the beginning of the present century are certainly wrong.

The late Mr. William Fullerton, whose name will be always associated with the improved breed of Angus cattle, left a report on the subject, in which he says that the Lord Panmure who succeeded to the estates in 1787, in his sixteenth year, was the first to try to improve the Polled cattle of the county, and that he always showed much favor for them, even during his minority. He tried the experiment of crossing the Galloway and Angus cattle, but the result was unsatisfactory, and this line of breeding was at once abandoned. He afterwards was successful in his efforts in another direction, but in the mean time the late Mr. Hugh Watson, of Keillor, on entering that farm, in 1808, at once began a systematic experiment of the Angus Doddies in which he was so eminently successful that his name is now regarded as the chief one in connection with pedigree stock of this variety. His father, who had bred these cattle before him, gave him six of his best and blackest cows and a bull on entering Keillor, which he soon afterwards increased by the purchase of ten heifers and a bull at Trinity Market, Brechin. These heifers came from the parish of Farnell, where the Earl of Southesk had an excellent breed of cattle about one hundred and twenty years previously, and the bull was from Seryne, near Arbroath. From this stock Mr. Watson produced the Angus Doddies, which made his name famous throughout the country.

The improved Angus cattle had reached such a degree of perfection in 1848, that the judges of the Highland and Agricultural Society's show held that year at Edinburgh expressed the opinion that "the highly improved portion of this much famed breed is not surpassed by any other description of cattle, in the equal way in which the fat is mixed and diffused over every part of the animal, or in yielding to the butcher a greater quantity of prime meat in proportion to the weight of the carcass."

In conclusion, I may say that I think it a great mistake to confine them to one color—black. They were formerly of many colors besides, such as black with brown muzzles and brown streaked backs, red, yellow, and brindled. Long as they have been bred to black, they still throw reds and yellows, which are discarded as unfashionable, while, as every breeder of domestic animals knows, off-colored and mis-marked produce is often the best in other respects. Variety of color is pleasing to the eye, and if the ignorant idea that red and yellow Polls show impurity of blood were got rid of, herds mixed in color would soon be common and admired.

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It is claimed, says James Macdonald, that the northern Polls surpass all other races of cattle in the production of beef. On that point there is, of course, considerable difference of opinion, for at the present day, when the beef-producing properties of our other leading breeds, notably the Shorthorn and Hereford, have been developed to so high a degree, it could not be expected that, with anything like unanimity, any one breed would be accorded the premier position. Be that as it may, the Polled Aberdeen or Angus breed may, perhaps, be said to be inferior to none as all-round beef-cattle, and superior to all others in some respects. The brilliant and unequalled position it has latterly taken, alike in the show yard and market place, sufficiently establishes its claim to that description. It may be noted that at the Paris Exhibition in 1878 it carried off every single honor for which it was entitled to compete, including the £100 prize for the best group of beef producing cattle in the exhibition, and in that British show yards, both as fat stock and breeding, it has attained to a leading position. In a strictly butcher's point of view, it has seldom to yield to any other race of cattle. The superiority over most other breeds, for the butcher's purpose, lies mainly in the excellent quality of beef, and in the high percentage of dead meat to live weight. As a rule, the beef of the northern Polls is very well mixed, and contains a greater proportion of compact, finely-grained flesh, and less soft, coarse, fat than most other kinds of beef. Inside, the carcass is usually well lined with fat of the finest quality, while in the density and quality of the carcass itself the breed may fairly enough claim the premier position among all our leading breeds of cattle. Some place the small Devon breed alongside, if not even before it, in this respect; but with that exception, probably, no other breed in the British isles will, on an average, yield so high a percentage of dead meat to live weight. In butcher's phraseology it "dies" well and "cuts up" admirably. In all the leading fat-stock markets in the country the breed is held in high estimation, and generally commands the highest prices, in fact, usually a higher price in comparison to its size and live weight than any of the other leading breeds. This is especially the case at the great Smithfield Christmas market in London, where the plump compact Polls from the north never fail to find a ready sale at the highest quotations.

The Aberdeen Poll is not a milking breed, being especially cultivated for beef, and it has been found impossible to obtain figures with any degree of accuracy showing the quantity of milk given per cow, or the butter and cheese value of the milk. We cannot indeed hear of a single case in which a more than ordinary dairy is composed of this race. With regard to size and weight for age, a few figures from the last Smithfield show will be found a sufficient guide. The first-prize steer at the age of two years ten months weighed 16½ cwt., and second-prize at same age 16 cwt. The first-prize steer at three years eight months weighed 21 cwt., and the second, at three years six months, 18½ cwt. The first-prize heifer at two years eight months was 17½ cwt. The Birmingham show figures were as follows: The first-prize Polled steer at the age of three years eight months weighed 18½ cwt., and the second-prize at same age 20½ cwt. The first-prize heifer, also of the same age, weighed 16½ cwt., and the second, two years eleven and three-fourths months, 15½ cwt.

This race is perhaps the best of all others for crossing with the Shorthorn; indeed, the most marvelous specimens of cross-breeds shown at the London and Birmingham shows are always of this cross. At the latter place the first prize steer, aged three years seven months, weighed 18 cwt. The first prize steer, aged two years eleven months, was 17½ cwt.; and the second prize, two years eight months, 17½ cwt. The first prize steer at two years five months weighed 14½ cwt., and the second at one year eight months gave the marvelous weight of 16½ cwt. At the London show one of the prize cross-bred steers at twenty months weighed 13 cwt. The first prize steer at two and three-quarters years weighed 17½, and the second prize at two years eight months, 17 cwt. Another first prize at three years eight and three-quarter months weighed 19½ cwt. The first prize heifer at three years eight months, 17½ cwt. The district in which the race is bred and fed, although not the bleakest in Scotland, is still much exposed; and the pasture is certainly not the best, but what is missing in the field is made up in the manger, for the northern farmers find it to their advantage to feed their cattle well, and especially upon cake. The race is not used for draft purposes."

Mr. G. Wilken, says:

With regard to the annual average pounds of milk which the cows give, and the quantity necessary for the production of butter and cheese, no such records are kept in Scotland. The breed is a beef-producing one, and has been so for many years. There have been noted instances of good milkers in the Aberdeen-Angus breed, but for many years Aberdeen and Angus have been feeding districts. The late Earl of Avila, of Cortachy Castle, gave particulars of a newly calved Aberdeen-Angus cow, which gave 11 Scotch pints of milk per day; and of another, three months after calving, which gave 12 Scotch pints. A Scotch pint is equal to three English pints, so

that these quantities give $5\frac{1}{2}$ gallons per day for the newly calved cow, and $4\frac{1}{2}$ gallons per day for the one three months calved, equal at $10\frac{1}{2}$ pounds to the gallon to 56 and 47 pounds of milk per day, respectively. With ordinary feeding the weight of cows at maturity would vary from 1,100 to 1,500 pounds, the dead weight of these being about 7 to 9 cwt. Many cases at Smithfield exceed 2,000 pounds live weight. Bulls, if fed well all their lives (which they usually are), weigh from 2,000 to 2,400 pounds at maturity. With reference to the age of the cows, they have been known to live over thirty years, and it is not uncommon to find some of the age of twenty years which are fresh and breeding. The proportion of meat at maturity of a fattened steer varies from 60 pounds per 100 pounds of live weight, to as high as 73 pounds per 100 pounds. The average steer in the Aberdeenshire district at two years and nine or ten months, when most of them are sold, weigh from $7\frac{1}{2}$ to 10 cwt., dead weight. The soil of the district is poor and cold, but has been greatly improved by draining, liming, &c., and the grasses mostly cultivated are rye-grass, and red, white, and alsike clovers. Many of the cattle are still used for draft purposes, especially in plowing and breaking up new land. Aberdeenshire was mostly reclaimed by the "twal oxen plow," managed by two men, "a plowman and a gansman," and an old saying illustrates best how farmers thrived in olden times, viz:

"He that by the plow wad thrive
Maun either haud or drive."

That is, must either hold the plow or drive the oxen. The system of feeding varies somewhat in different localities, but the following is the most common, viz: From 1st to 10th May to middle of October the cattle go out on the grass in inclosed fields, but feeding-cattle are turned into the house a month earlier. From the middle of October to May the cattle in Aberdeen and Banffshire are generally tied up by the neck. In Moray and Inverness, north of Aberdeen, young cattle are fed in covered courts. The feed, in each case, turnips and oat straw only. In some cases young heifers and bulls get from $1\frac{1}{2}$ to 2 pounds of linseed cake daily after weaning till early spring. The reason so little is known as to the milk-producing properties of the race is because the calves mostly all suckle their dams from five to six months, when the cows are allowed to dry off.

(12) SHETLAND CATTLE.

Perhaps the least-known race of cattle in Great Britain is the Shetland, which is by no means a large one, and is almost entirely in the hands of one great nobleman, the Marquis of Londonderry. We are unable to obtain an illustration of the cattle, but we are indebted to Mr. Brydon, the popular steward of the marquis, for the following particulars. He says:

I am unable to give statistics as to the capabilities in the dairy of the Shetland cattle, but I know that when well fed they are good milkers and that the milk is rich. We use them chiefly for nursing calves, and we cannot get cows of any other breed on which they do so well. I can give lots of instances of this, but, at the moment, I remember one in particular. We had on the farm a little Shetland cow which calved about the 1st of June, and as she seemed to have a lot of milk we procured another calf and made her nurse the pair. Both calves were sold by auction when eleven months old, and the pair realized £42, the purchaser being a butcher. Of course the cow had cake and meal during the winter. The first cross from a Shetland by a Shorthorn bull also makes a very good cow.

The native home of the Shetland cattle is, as might be supposed, the Shetland Isles, which are situated between $59^{\circ} 51'$ and $60^{\circ} 51'$ north latitude, and $0^{\circ} 41'$ and $1^{\circ} 50'$ west longitude. The rocks are all primary, gneiss, granite, quartz, and stone slate being the prevailing formations, but in some parts there is a coarse variety of the old red sandstone and conglomeration. A great part of the surface is covered with peat, though there are generally green patches close to the sea. The hills are not high, only one in the whole group measuring 1,400 feet. The temperature is higher in winter and lower in summer than that of the Scottish mainland, the mean being stated as $45^{\circ} 5'$. Grass grows luxuriantly for a short time in summer, but in winter and spring, the islands present a bare, barren appearance.

The cattle have a hard life of it through, and as calves they scarcely get any milk, that being kept for other purposes. In spring they are so reduced with poverty that any one not acquainted with them could hardly suppose it possible they would come round, and yet a short time on coarse keep makes them look fresh and well. I have seen them thrive well on pasture where other and finer-bred cattle could not live. As may be expected, the treatment to which they are subjected stunts their growth, but if well fed when young they become very little less than other breeds.

(13) WEST HIGHLANDER CATTLE.

As a milker, possibly the West Highlander cow has not much of a reputation, yet whatever milk she gives is exceedingly rich, and the men who are reared in a Highland glen, on good West Highland cream and some oatmeal bannocks, have little indeed to complain about. As to its beef, as is well known, it is the best to be found in the London market, and always commands as ready a sale as the best Shorthorns, Herefords, Galloways, or Polled. Though the West Highlanders thrive better on their native heath, they do very well in the South, and many of their admirers have displaced the deer from their parks and substituted the shaggy beast, thus revising to some extent the present process in the Highlands. They are thus ornamental as well as useful, and fetch better prices in the market than would the savory venison. As the points of the West Highlanders have never been laid down, it may be well to give here the opinions of all the noted breeders, together with some slight history of the most noted herds.

Characteristics of West Highland cattle.—The head should be beautifully proportioned to the rest of the animal; the fine head with a large tuft of hair on it; the nostrils full; the eyes large and liquid. There should be a proportionate breadth betwixt the jaw-bones behind to the large forehead in front. The horns should be lengthy, and showing what is called blood to the very point; they should come level out of the head, inclining forwards and upwards; in the cow they should rise up with a graceful slope. Some breeders do not care for the horns to rise upwards, being of opinion that the less rise there is the better. Perfection in a cow's horns is of two kinds, according to taste, but some prefer them to come out level from the head, with a peculiar back-set curve and a wider sweep. In the bull the horn should be decidedly strong, and what is termed sappy. Some are of opinion that when the horn droops suddenly from the crown to where the upward curve commences it is a sign of weak back. The cow's horns rise sooner from the head and are a little longer, preserving their substance and rich color to the very tips.

The neck should in length be proportionate, clean below, and in cows forming a straight line from the head to the shoulder. In point of thickness it should be fully developed, and the bulls should have a crest. The shoulder should be thick and immensely filled out downwards from the point to the lower extremity of the fore-arm.

The back, from the very back of the shoulder, should have a fully rounded development, what judges call "plain"; that is, a hollow behind the shoulder, as if you had tied a string about it, is exceedingly objectionable. Across the hips there should be great breadth, while from the hips backwards the quarters should have a very large development, being square betwixt the hips and the tail and betwixt the tail and the hind feet. As in the fore shoulders, the hind thighs should have an immense development. The tail should be thick and strong, with a full bunch of hair hanging down towards the ground. The bone, both in the fore and hind legs, should be thick, broad, and straight; the hocks large and well set on, and the legs feathered with hair. There should be great breadth betwixt the fore legs, and the animals should walk with great dignity of motion; indeed, unless an animal possesses this dignified style of carriage, he will have small chances of winning prizes in the show-ring. The hair should be long, with a graceful wave in it—a curl in it is a decided fault—and should possess much bloom. The

lack of wave in the hair is considered to be a great objection in many of the modern herds.

As a rule, the color is black, but fashion now runs on yellows or light duns and on brindles. A well-arranged herd should have a mixture of colors, avoiding all those which indicate unhealthy thrivers. A well-marked brindled bull is, however, all things being equal, a difficult one to beat at any northern show. A modern prejudice exists in some quarters against Highlanders being marked all over with white spots. They are not considered, however, to be of impure blood, and Mr. Stewart, of Tigh-Duin, one of the oldest and ablest authorities, is of opinion they were looked upon by all breeders as marks of purity or superiority. Possibly, too, he thinks that when the Ayrshires came into the Highlands the prejudice, which is a senseless one, arose. As regards the absence of the wave in the coat of modern show-yard representatives, it is held that it is to be accounted for by the growing desire to make Highlanders grow big, and from too kindly treatment. The more exposed the animal is the better does his hair grow. The whole points of the animal have to be considered, indeed, in the light that he has to make a living in a bare and storm-exposed locality; that, indeed, he has to thrive where a Polled Angus or an Ayrshire would starve. The question of thickness of skin, where fat, is one which is not left out of consideration; as in other animals, the sweetest beef being, as a rule, that under the thinnest skin. But a West Highlander with too thin a skin would not thrive well on the side of a wind-swept hill.

Though the West Highlander is not a good milker, she as a rule always gives enough and more to suckle her calf, which is allowed to run by her side till far on in the autumn, when it is weaned. Cows to calf are generally housed from the end of November to the middle of January, according to the weather and dates of calving. Young and yearling cattle, possibly, do better when wintered out with open sheds for shelter erected in the fields. Thousands, indeed, in some localities are never housed at all, unless snow is deep, and even then they thrive tolerably well if a little hay is given them, and they have some little shelter from a bit of woodland or the projecting side of some hill. When first put in in May they are fed upon straw or the coarsest of the meadow hay; after calving, upon meadow hay supplemented with turnips. When in finest bloom the West Highlander is indeed a perfect picture; and that is generally in the three last months of the year. His coat of hair is then at its best, and he looks every inch a monarch, prepared to fight and wrestle with the north wind.

Possibly on the richer pastures of the Lowlands he would not look so well. Still at all times he looks by far the most noble of the bovine race. For parks he therefore is in good demand, and it is possible that he may find a home in every demesne where his picturesque appearance becomes well the woodland scenery. No doubt in many places of the Highlands he has been supplanted by the Ayrshire, Shorthorn, and the Polled, but where herbage is thin and scant and there has to be some mountaineering to get it, Donald Buidhe and Duncan Ruadh will hold their own. It was thought by many that the West Highlander would have well suited the ranches of America, but what is wanted there is not animals to increase the weather-defying qualities, so to speak, but to promote the tendency to make beef, the Texan stock possessing many of the powers of endurance for which the West Highlander is noted.

Noted herds of West Highland cattle.—Of the most noted herds which at present are kept very pure in the Highlands may be mentioned that of Rossie belonging to Lord Kinnaird. This herd was formed four years

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ago on the dispersion of the famous Urlar herd, on the 16th May, 1878, by the purchase of some of the best of that old blood. A much older herd is that of Poltalloch, which was formed as far back as 1795, from stock purchased at Castle Craignish and in the island of Shuna. The annual sale of the Poltalloch draft affords opportunities to breeders who may wish to establish similar herds.

At Benmore there is also a famous herd which was formed in the years 1873 and 1876, by selection from the then famous herd of Mr. John Stewart, Bocharstle, Callender, including the celebrated bull Don-achadh Ban Nan Oran and the cow Phrasing 2nd. The former won the first prize at the Highland Society's Show at Edinburgh in 1877, and also first prize at the great show in Paris. The cow mentioned also won first honors wherever exhibited, and her victories include a first prize at Paris. While at the latter exhibition the famous bull was admired by Rosa Bonheur, who subsequently painted his portrait for Mr. Duncan.

The Breadalbane herd which was dispersed in 1862, on the death of the late marquis, was reformed under the late earl in 1871, with purchase of some stock at the Urlar sale mentioned, Urlar being indeed close to Taymouth Castle. Some of the old Breadalbane cows were also secured by Mr. Dunn, his lordship's manager at Kenmore Mains, also the second prize Highland and agricultural bull Ossian, bred by the Duke of Athole. Since then the herd has been increased by several selections from the Bocharstle and Poltalloch herds, the present earl taking an interest in it.

Amongst other noted herds are those of the Duke of Athole, Lord Dunmore, Mr. Stewart, Duntulm. Mr. Stewart, of Tigh Duin, Killin, is one of an enthusiastic family of breeders who have stuck to the West Highlander for several generations. Indeed the history of the West Highlander is interwoven with that of the family.

That the West Highlander has a future before it many good judges think. Its beef is the richest in the market, and in these days of quantity, quality is certainly worthy of consideration. A herd book is being got up for them by Lord Dunmore, and, though its Gaelic may be almost untranslatable, in the long run it will spread its popularity. The West Highlander, grand as he is, does not yet suit the views of the butcher, and Mr. Dykes admits that although this is the case he is being brought back to his ancient self among Scottish cattle nobility, and is yearly the wonder of the Londoner at the annual Smithfield exhibitions.

Mr. Drummond Moray, of Blair Drummond, Stirling, a famous exhibitor of the race, says:

Highland cattle are not bred here, but are bought in at from eighteen to thirty months old for the purpose of being fattened. Heifers at the age of three and a half years will, with ordinary feeding and 4 pounds of cake per day for the last three months, feed up to 5 or 5½ cwt. That is the weight of the carcass of beef after being slaughtered and dressed. Oxen of the same age and fed in the same way, with a little additional cake during the last three or four months, will feed up to fully 7 cwt. of beef. These weights can be attained at an earlier period by giving better food and commencing the cake earlier, or the weights may be very much increased by keeping on the animals for another year, but as a rule it pays best to fatten Highland cattle off the grass when they are about three and a half years old. Many excellent animals of this breed have been fed here for show purposes, the weight of which when slaughtered came up to 12 or 13 cwt. of beef, but these were generally four and a half years old or a month or two more. The proportion of beef to the live weight of a good, well-fattened Highland ox is nearly two-thirds of the weight. The animals are hardy, and after the first winter (when they should be housed) they thrive in any sheltered situation, but when they get into good condition they should be put into courts to prevent the loss of flesh in cold weather. None of this breed are used for draft purposes in this district, and I never saw them so used anywhere.

Mr. James Duncan, whose herd at Benmore has been already referred to, gives us some further information. He says:

My Highland cattle are kept by me simply for breeding purposes. I do not separate the calves from the cows. Although I cannot tell how much milk my cows give, yet the quality of it and of that from the Highland cattle in general is very fine. Highland cattle are never under cover; they are very hardy and will live where other animals would starve. I have a considerable number on the hills in Scotland. The grasses are native, and in winter the cattle eat heather furze and other rushes. The master of Blantyre has succeeded in working Highland cattle; and it is a well known fact that they produce the finest beef. When in America in 1876 I advised some of the western farmers to give them a trial, as in many districts they would do far better than the Shorthorn; for instance, on the Rocky Mountains and in some of the plains they would do very well, but where there is an abundance of fine grass it would be a mistake, in my opinion, to introduce them. I may mention that there is only one question about the adaptability of Highland cattle for America, and that is the extreme heat of summer.

Sir John Swinburne, an eminent owner of this breed, says, in answer to a communication from us:

I do not breed the Highland cattle, but buy them at about twenty-four to thirty months old, at Falkirk Trysts, which are held annually in September and October. Their native homes are not cold, but constantly wet from rain and mist, and there is not much snow. Their long hair enables them to remain out all winter, and they will thrive, but do not grow fat, on very rough pastures, and bear whatever cold there is remarkably well. The age at maturity of the cow at maturity is about four years, and the live weight of the cow at maturity is about 7 stone, and that of the bulls about 97 stone. The proportion of meat at maturity of a fattened steer is about two-thirds of its live weight. I have never heard of the West Highlander being used for draft purposes. They are housed in open boxes and fed and handled in the same manner as other cattle.

The Earl of Seafield is one of the large breeders of this race, and we consequently put a series of questions to his steward, who has kindly given us the following particulars in reply:

With regard to the annual average pounds of milk per cow, I find the quantity to be 3,780 pounds.

A cow which matures in four years is 11 cwt. in weight, and 64 feet in girth, whilst a bull arrives at maturity in five years, weighs 14 cwt., and has a girth of 7 feet. Oxen are five years old when at maturity, weigh 16 cwt., and possess a girth of 7½ feet. The soil on which the cattle are fed is light and gravelly, and the mean temperature of the district in summer is 60°, and in winter, 40°. The grasses cultivated by his lordship are used for the purposes of draft. As to the housing of them, they, in winter, have open courts and byres, and the feeding is principally permanent pasture, and in winter straw and turnips. Breeding begins when the animals are from two to three years old; and as to handling, they are generally housed in winter in our part of the country, but in the West Highlands they seldom are housed, but in stormy weather they are fed on meadow hay.

Mr. R. B. Saunders, of Guisbro, Yorkshire, who resided among the West Highland breed of cattle on the west coast of Scotland before going to act as the agent of Sir Joseph Pease, M. P., says:

This breed is managed under a variety of systems, some only keeping cows for breeding purposes, others buying the young cattle and keeping them from one to two years before selling them to the owners of parks and good pastures, when they are fattened. This applies to both heifers and bullocks. In a few cases the heifers are crossed with a Shorthorn bull, and after rearing a good calf are fattened. The West Highlands being devoted to meat production, and rarely used for dairy purposes, it is, perhaps, impossible to obtain in the British Islands any reliable record giving the annual average yield of milk per cow or the quantity required for the manufacture of a given quantity of butter or cheese. The size of the animals varies according to the given food and when young.

The cows mature at five years old, and weigh 50 stone, of 14 pounds each, dead weight. Bulls are at maturity at four years and oxen at the same period, the former weighing 70 stone, of 14 pounds, and the latter, 60, dead weight. The steers equal the Shorthorns in the proportion of meat on arriving at maturity. The nature of the soil in the valleys is deep loamy, that on the higher grounds a thin covering of dry friable

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soil, partly lying on whin-stone (trap-rock,) and the Western Islands on granite. The mean temperature in summer is 10°, and 45° in winter. The animals are never used for the purposes of draft. The in-calf cows have generally the best sheltered ground, with an open shed, but in some cases are tied up in houses. Through the winter the calves have the same housing. The food consists of bog or meadow hay, twice a day after the 1st of January. The young store cattle are not housed after they reach one year old, and in many cases only get hay or straw when the rough grasses in the woods and valleys are covered with snow. On some farms where straw and turnips are grown the cows and calves are partly fed on these. In a great many instances all the three-year-old cattle leave their native grounds for gentlemen's parks, when they are given hay and cake once a day through winter. The cows are usually disposed of from eight to ten years of age to the butcher. In the best herds the heifers are not served by the bull until three years of age.

Mr. Robert Stewart, of Stirling, says he never breeds the West Highlander for dairy purposes, and that although they give no great quantity of milk, yet it is rich in quality. His calves suck the cows, and follow them at foot in summer. The breed at about five years is at maturity, and 7 cwt. is, he considers, a fair average live weight for a well-bred cow, 10 cwt. for a well-conditional bull, while a well-bred and well-fed ox at that age should average 16 cwt. The proportion of meat at maturity of a fattened steer is about 10 cwt. Here, where the cattle are mostly bred and not fed, their food consists only of rough natural grass in summer and meadow hay in winter. None of the animals are used for draft purposes of which Mr. Stewart is aware, and as to housing, he states that the cows are in winter housed, and also that the calves are put in in winter till a year old; but the bulls and two-year olds winter quite as well outside. The feeding is generally meadow hay. The animals, except those for breeding are generally sold when two years old.

(14) GALLOWAY CATTLE.

The secretary of the Galloway Cattle Society (the Rev. Mr. Gillespie, of Mouswald), says the Polled Angus is a magnificent breed for particular circumstances; but there is not a breed possessing so many recommendations to American breeders as the Galloways. There is no breed of Polled cattle in Britain so impressive and influential as the Galloways in crossing with horned cattle, with the view of getting quit of the horns. He affirms that where a pure well bred Galloway bull is put to cows of any horned breed the produce in ninety-nine cases out of every one hundred will be polled, and he leaves those in a position to judge to say whether there is any other Polled breed of which the same can be said. Then there is their hardy character, which is a great point in their favor. There is no breed he states, except perhaps the West Highlands, so peculiarly fitted for exposure to extremes of heat and cold experienced in many parts of the Western States, where a large number of cattle have to lay out at all seasons. The breed is also a capital beef producing one, and he is sorry to observe that in recent years breeders have been doing so little towards bringing this quality before the notice of the public.

As an instance of what may be done he refers to the way in which Mr. McCombie has taken the Polled Angus breed into the world and made a name for it. That gentleman has shown the public the merits of the breed, and the result is well known. The Aberdeen farmers have great reason to bless the name of the late Mr. McCombie in all time coming, says Mr. Gillespie, and he thinks the breeders of Galloways have been too backward in showing the world the superiority of their animals for beef producing purposes. Outsiders, however, are begin-

ning to see that the breed possesses great merits, hence its growing popularity. In 1861 Mr. McCombie won both at Smithfield and Birmingham with Galloway animals bred by the Duke of Buccleuch; and in 1872 Mr. James Cunningham won a prize with a heifer bred by Mr. Biggar, of Chapeltown, which had previously taken first prizes in the Highland Society's Shows, and afterwards won the champion prize in the Polled class at Smithfield. Mr. Gillespie thinks the Galloway breeders are greatly indebted to Mr. Jardine, of Castlemilk, for what he has done in recent years towards bringing the breed to the front, and that the cattle had a better name in the world ten or twenty years ago than it at present has simply because more was done then than now to display their merit. It, adds Mr. Gillespie, the breeders all over the country had taken pains to maintain the prestige of the stock they would now have been in a much more favorable position, and if now they do their duty to their cattle the money value of the animals will rapidly rise.

The Galloway is not a special milking race, and is little used for either butter or cheese making, nor is it used for draft, although a few isolated farmers may be seen with it at the plow. They are an old breed, and were highly valued as long as fifty years ago, when small horns were sometimes seen. Then their average weight was 60 to 70 stone, but it is now much increased. The hide is thin and the meat is wonderfully well marbled, and found in the best parts in abundance. They are bred in Scotland almost entirely, but large numbers are brought into England and sold at the fairs to farmers for fattening. The milk, tolerable in quantity for a grazing beast, is decidedly rich, but it is largely the custom to spay heifers, and at one time the practice was still more general. The calves are very often allowed to run with the dam, but to have only one-half her milk, the other half going into the house. This is managed by the dairymaid milking two teats twice a day and affixing a spiked muzzle to the calf. The Galloways are grand beasts, and their native home is the wet mountainous district of the southwest of Scotland, and although considered by some people to be similar in character to the Polled Angus, they are much harder and more vigorous as a race. There is no question that they are not such early maturing beasts as the Angus, the Hereford, or the Shorthorn, although, in truth, they have hitherto received no such help from the breeder as has been bestowed upon those famous races. The Galloway is thicker in its hide than the Angus, and when it is remembered that to withstand exposure and extreme cold this is necessary, it will be understood that for mellowness, and consequently meat production, it would be hardly fair to claim the same quality for the one as for the other. For these cold bleak districts, more especially if they are also wet, the Galloway will at all times beat his more polished rival.

The Galloway Poll is not such a very bad feeder. Half a dozen cattle were recently sold by live weight to a Liverpool butcher at 9d. per pound of carcass weight, which was assumed to be 53 per cent. of their live weight, ascertained on a weighing-machine immediately before the meal hour. The lot consisted of three two-year old bullocks and an equal number of Shorthorn-Ayrshire crosses of the same age. Four of these animals had been bred on the farm, and the remaining two had been summered and wintered on it. They had been fed in the same manner as the previous lot, and the balance of percentage in the butcher's favor was even higher than in the first lot. From the following figures it will be seen that the Galloways killed decidedly better than the Shorthorn-Ayrshire crosses. The former showed a higher carcass weight

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than was estimated, while in the case of the crosses a contrary return was made. The following are the details:

Description of animal.	Live weight.	Estimated carcass weight.	Actual carcass weight.
	<i>Stons. pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Galloway bullock.....	72 6	537	602
Do	71 7	530	560
Galloway heifer	75 2	557	590
Cross bullock.....	74 0	549	509
Do	59 10	443	408
Do	60 0	445	492
		3,061	3,158

SECOND REPORT ON THE GALLOWAY CATTLE.*

The Galloway breeders of England and Scotland are justifiably jealous of the efforts which have been made from time to time by rival breeders to depreciate their breeds, or to insinuate that their origin is of recent date. There can be no doubt, however, that the Galloway is one of the oldest of our pure races, and that it has been bred for many generations to a particular type, while it is believed to be beyond doubt that they have contributed in a marked degree to the formation and improvement of some of the other leading British breeds. At all events it is known that they have entered largely in times gone by into the east of England breeds, more especially in those districts which are now famous for the Red Polls.

During the last century the Galloway was perhaps better known than any other breed, for it has been very frequently described by agricultural writers of that period as a symmetrical beast of high quality and considerable beauty, and one which was adapted for early maturity and rapidity in fattening as well as, or perhaps better, than any other breed that was then known. This quality they have maintained to the present day, and it is the more remarkable, inasmuch as the pastures upon which they graze are much inferior to those in other parts of the country where equally famous breeds are bred and fed. At the present time they maintain their position for rapid growth and good feeding, and they have for a long period held a leading place in the London meat markets, where they are not infrequently found at a very early age, the grain of the flesh being extremely delicate and rich in flavor as well as finely marbled with fat. Whether or not the breed has at any time been crossed with the horned races of England it is difficult to say, and the information is somewhat conflicting, the Galloway breeders entirely disbelieving it, and quoting the apparently absurd results which would have been obtained by the use of horned bulls, although it is forgotten that in crossing horned beasts with either the Galloway or the Aberdeen it is a fact that almost every animal produced comes without horns. That Galloway breeders have been most skilful in their work as well as in their feeding and management there is no doubt, but we should not like to assert in any dictatorial manner that they, like other breeders,

* In forwarding this second report on Galloway cattle, under date of March 15, 1884, General Shaw says: "I herewith forward with pleasure a supplemental report on the Galloway breed of cattle for insertion in the able and full report which I had the honor to transmit on the 19th of February. Mr. James Long, who has prepared the same, thinks this additional data specially useful."

have not now and then found it beneficial (we speak of the past) to have recourse to other breeds for improvement.

There appears to be a tradition that at one time the race was horned, but it is certain, however, that those who have pretended to keep it pure have at all times abolished every trace of horn, and declined to use animals for which had this apparent blemish, and one which was considered a certain sign of impurity. It is believed at the present day that there is far less sign of horn even in the most incipient stage in the Galloway race than there is in either the Red Poll or the Angus.

It has been stated repeatedly that the Galloway is a more vigorous, lusty, and hardy beast than any other variety, inclusive of the Welsh and the West Highland; that it exceeds the Welsh in these respects there can be no doubt, but we do not think it is quite so hardy as the West Highland, the coat of which enables it to brave the weather at all seasons of the year better than any of our native breeds. Again, the breed has often been charged with coarseness on account of the thickness of its skin; but it must be remembered that the breeders, while endeavoring to improve the quality of flesh by every means in their power, have studiously retained a certain thickness of skin which they have justly considered to be consistent with their hardiness, so that in reality it is one of the principles of the breeders of the Galloways to combine, as far as possible, quality of flesh with a tolerable thickness of skin, and it is somewhat remarkable that in this they have succeeded; for, excepting in the thinnest skinned beast which is much less hardy, there is no animal more mellow to the touch or full of quality. They also endeavor to retain, as far as it is possible for them to do so, a thick coat with rather long hair, for, although they do not inhabit a district so wild or so high and bleak as the West Highland breed, that portion of the south of Scotland and north of England is by no means well protected from the weather and the winds even in valleys. In some parts they are placed on the hills, which, as is well known, are bleak and exposed in the extreme, and there they appear to thrive uncommonly well, and to occupy ground from which it is not likely they will be displaced by any other native breed, unless the West Highland should be introduced, which is most unlikely.

It has often been remarked by foreign buyers visiting the Galloway district that they could not have believed it possible to maintain, in such great perfection, many of the herds of high-bred Galloways which they have seen, in these cold and elevated regions (sometimes 1,500 feet above the sea), where nothing is found but the famous mountain sheep of the country, and decidedly miserable fare, for the crops cultivated are necessarily few and poor. Again, notwithstanding the fact that the winters are most severe, it is frequently the case that the Galloway is entirely kept out of doors; occasionally an open shed is erected for them to shelter themselves when they choose, but as a general rule they have to rely for protection upon that which nature affords, sometimes being assisted with a little hay, which is usually carried to them when snow is upon the ground or when the frost is severe. It is stated by Mr. Gillespie that this system is pursued, not because of the expense or trouble, but because the farmers believe that they are able to stand the winter with ease and to grow much better during the following summer than if wintered under cover.

Young beasts of from 1½ to 2 years old are often sold in the markets at £25 to £30 each, never having been sheltered since they were weaned. This vigor is not solely the characteristic of the adult beast, for when a cow calves in the open, in severe weather, the calf itself does not ap-

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pear to lose activity or to feel the severity of the weather as might be expected, but is as happy and contented, when thoroughly dry, as if in a warm stable upon plenty of straw. The hardy constitution of the breed enables it (and this is somewhat strange) to withstand the fatigue of long journeys to market towns as well as it withstands the cold of winter; and when it is found necessary to drive any of the beasts to fairs, at distances of from 100 to 200 miles, they usually arrive in a much fresher condition than any other animal known to the cattle dealer.

It is stated above that Galloway beef is favored in the London market by the butchers; indeed it may not be known that it is classed as prime Scot, a term so well known to readers of the London newspapers, where the price of meat is quoted. It has repeatedly been proved, not only by the meat salesmen themselves, but by breeders and feeders, that no beast obtains a higher price, not even the Aberdeen, and certainly not the Shorthorn or the Hereford. In fact it is very seldom that meat of any kind, at the Christmas market especially, reaches the quality of the best Galloway. Testimonies without number could easily be obtained, and several have been obtained by the Galloway society and published in their description of the breed, in which butchers in various parts of the country have testified to the quality and value of the meat. The Galloways are generally considered to dress to the extent of 60 per cent. of their live weight, and occasionally an animal is found to exceed this, which, it will be admitted, is exceptionally good. This depends chiefly upon the system of the feeder and on the management of the animals.

The following quotation from the description of the Galloway by the editor of the Herd-book, will be of some value in arriving at a knowledge upon this point:

Age.	Live weight.	Dead weight.
One year three months	Pounds. 900	Pounds. 540
Two years three months	1,400	840
Three years three months	1,750	1,070
Four years	2,000	1,240

While these may be regarded as an average, far heavier weights have been reached whenever an effort has been made to force forward individual animals. It appears from the catalogues of the Smithfield Fat Stock Show that in 1883 a pure bred Galloway steer, at two years ten months three weeks old, weighed 19 cwt. 20 pounds, viz, 2,148 pounds weight when 1,055 days old, which makes an average of 2 pounds daily increase in live weight.

In 1882 a pedigree Galloway steer, two years nine months one week old, weighed 17 cwt. 18 pounds, viz, 1,922 pounds weight when 1,004 days old, which shows an average of 1.91 pounds per day of increase. Another pedigree Galloway at the same show turned the scales at 15 cwt. 2 quarters 18 pounds, when two years eight months three weeks old, viz, 1,754 pounds weight when 973 days old, which is equivalent to 1.8 pounds of daily increase. It seems remarkable that at the principal cattle shows in England the Galloway is seldom seen, and this is more particularly the case at the Christmas fat-stock exhibitions. The demand being considerable, and as the breeders live at a great distance and do not care for the system of forcing cattle for exhibition, they

prefer to leave the glories of the prize ring to the other Scotch breeds, such as the Angus and the West Highland.

This, perhaps, in a measure (although it would be impossible to detract from the value of the breed), has without doubt contributed to the popularity of the other breeds and to the want of knowledge with regard to the Galloway itself.

As this breed is so essentially a meat-making one, it will hardly be supposed that as a milker it has any especial value, but, like the Devon, although it does not give a large quantity, it gives milk of a marvelous quality. Some strains, however, give very much more than others, while there are those which make a most respectable quantity of butter in proportion to the milk they give. Speaking of it generally, it is a non-milking breed; hence we have found it entirely impossible to obtain any authentic records either of milk, butter, or cheese production, although there are numerous cases in which owners have estimated the yields of particular cows at from 9 to 12 pounds per week in the middle of the summer season. We believe, however, that just as the Red Poll of Suffolk and Norfolk has been by judicious selection converted into a milk-producing breed, so by great care in selection and breeding the Galloway could be made, certainly not the best of milking breeds, but one of considerable value, such as would prove most profitable to those who kept it for the purpose of making either butter or cheese.

That the marvelous prepotency of the Galloway breed is an evidence of its purity and ancient character we firmly believe, and, as we remarked above, just as when mated with horned cows it produces the calf without horns, so does the color of the progeny remain, being either an entire black or a black which is slightly mingled with white or shaded with blue. This fact leads us to make the suggestion that it would be possible to cross the Galloway upon, for instance, Shorthorn cows of superior milking quality and yet maintain the chief characteristics of the breed, and as it is admitted, even by the breeders themselves, that it is often difficult to tell a beast which is only half bred from one of pure breed, so is it apparent that many of the objections which have been made to Galloways as feeders have arisen from the fact that the observation has not been made from the pure breed, but from the cross-bred itself.

The Duke of Buccleuch put his famous Galloway bull Black Prince of Drumlanrig (546), to two long-horned West Highland cows, carefully selected from one of the oldest and best herds of that noble breed. When the produce of this cross, two heifers, were grazing at the age of about eighteen months among a lot of nearly a score of pure-bred pedigree Galloway heifers, half a dozen of the most experienced and best-known breeders of Galloways were asked by the duke's manager to point out the half Galloways among the pure ones, and each one of these experienced judges picked out the wrong animals, so closely did the one in every particular resemble the other. Galloway bulls have been very extensively put to both Shorthorn and Ayrshire cows, and in England especially it has been a favorite and highly successful mode of crossing for beef purposes to use the Shorthorn bull on the Galloway cow. By either mode symmetrical cattle of very large frames have been produced; they have proved to be hardy, and their meat is free from patchiness, well mixed, and altogether superior. Galloway crosses, when liberally reared and fed, mature early and reach very heavy weights. At the Smithfield fat stock show in 1882 a cross steer, by a Shorthorn bull out of a Polled Galloway cow, weighed 1,480 pounds when one

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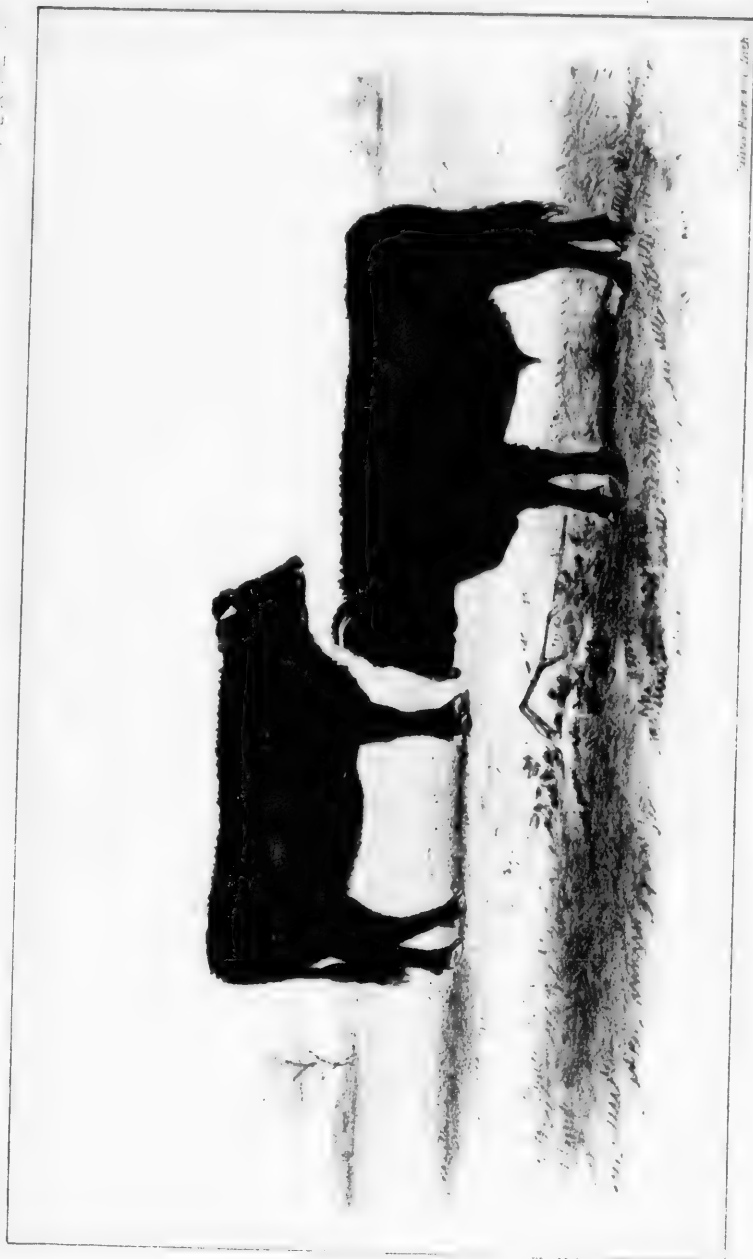
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year and eight months old, showing the high average of 2.43 pounds per day of its life. At the same show a Galloway cross, similarly bred, weighed 19 cwt. 3 qrs. 20 lbs. when three years four months old, that is, 2,232 pounds when its age was twelve hundred and seventeen days, which is equivalent to an average of 1.83 pounds daily since it was calved. At Smithfield, in 1883, the only Galloway cross steer exhibited turned the scales at 1,816 pounds when ten hundred and eighteen days old, making an average of 1.78 pounds of daily increase.

Characteristics.—The council of the Galloway Cattle Society of Great Britain have drawn up a standard showing the characteristics of the Galloway breed, which are as follows:

Color: Black, with a brownish tinge. *Head:* Short and wide, with broad forehead and wide nostrils, without the slightest symptoms of horns or scurs; eye, large and prominent; ear, moderate in length and broad, pointing forwards and upwards, with fringe of long hairs. *Neck:* Moderate in length, clean and filling well into the shoulders, the top in a line with the back in a female, and in a male naturally rising with age. *Body:* Deep, rounded, and symmetrical; shoulders, fine and straight, moderately wide above (coarse shoulder points and sharp or high shoulders are objectionable); breast, full and deep; back and rump, straight; ribs, deep and well sprung; loin and sirloin, well filled; hookbones, not prominent; hindquarters, long, moderately wide, and well filled; flank, deep and full. *Thighs:* Broad, straight, and well let down to hock (rounded buttocks are very objectionable); legs, short and clean, with fine bone; tail, well set on and moderately thick. *Skin:* Mellow and moderately thick; hair, soft and wavy, with mossy undercoat (wiry or curly hair is very objectionable).

(15) WELSH CATTLE.

Mr. Harvey, editor of the Herd-Book, says:

The Black Welsh cattle are natives of the counties of Pembroke, Carmarthen, and Cardigan, and are more generally known as Pembrokeshire Blacks, subdivided into Castlemartin and Dewsland breeds. From Cardiganshire they also extend along the North Wales coast up to Anglesea, and are then called the North Wales or Anglesea breeds. Whether they were ever indigenous to Radnorshire or Breconshire I am not aware, but as I have an intimate knowledge of both these counties, I can say from long personal observation that they are not now to be found in either of them. In Glamorganshire they are to be found in the seignory of Gower; but in the eastern part of the county there is a native breed, which is, however, becoming rapidly supplanted by Shorthorns and Herefords.

The breed of Black cattle is generally supposed to be descended from the *Bos primigenius*, and is allied to the wild cattle in Chillingham Park, and also to the Devons. They may be described as a horned breed, generally of black color, and frequently with white marks on the udders of the cows, also a few white hairs at the end of the tail. Sometimes a few white hairs are mixed up with the coat, but this is not always hereditary, and only comes out occasionally. A brown-black, approaching a chocolate, is considered a good color. Occasionally there are some cows striped red and black; also some quite white, with black ears, muzzle, and feet, but these are becoming very rare. The horns should be of a rich yellow; they are generally tipped with black, and do not come out yellow to the very end like Herefords. There is a different pitch of horn for bulls and cows. A bull's horns should be low and well spread; the cow's narrower and the pitch more upright. The steers and oxen take more after the bulls. This description applies in a great measure to the Anglesey cattle. These are, however, broader on the back and shorter in the leg, with more hair. The heads are heavier and the horns not so yellow as the Pembrokeshire. A really good animal of the Black breed should approach very closely in shape to the modern fashionable breeds, and by careful and judicious crossing this has sometimes been attained.

The natural characteristics of the breed may, however, be described as narrow on the shoulder and chine, slack on the loins, an inclination to be high on the rump, and flat-sided. They are generally deep in front and light behind. It must not, however, be supposed that every bullock has all these defects, but some of them are to be found in the generality of the cattle offered at the country fairs. Other breeds of cattle with these natural defects may also be found, but care and attention have modified them very much, and the object of the Herd-Book is to create such an interest in the Blacks as may render badly shaped cattle as "few and far between" as they are in the Hereford and Shorthorn districts.

The special characteristics of the Blacks, which make them so valuable, are: Hardihood of constitution, aptitude for dairy purposes, and docility.

As regards hardness of constitution, no one acquainted with the common method of rearing the calves and their subsequent treatment and the hardships they undergo can have any doubt on that point. The great wonder is that respectable-looking cattle can be shown after having been reared in such a manner. During the time when the rinderpest caused such havoc, that fell disease was not known in South Wales, principally from the great exertions made by the county magistrates and other authorities to prevent the transit of infected animals, but also because the constitutions of the cattle were so good that even on the frontier of infected districts they repelled the disease. When the Blacks were taken into counties where the rinderpest was prevalent they seldom, if ever, caught the infection. The same immunity also existed when the foot-and-mouth disease was so general. There were certainly some cases supposed to have been caused by the importation of Irish cattle, but upon inquiry it will be found that those herds of cows which consisted of Shorthorns, Ayrshire, and Guernsey were those that suffered.

As to aptitude for dairy purposes, I do not trust merely to the report of others, but, having for some years had a dairy of from 18 to 20 cows, I can speak personally of the qualifications of this breed in that respect. Some of these 20 were in every year heifers which had their first calf, and were not so profitable as older animals. My account book shows the churning as under:

	Pounds.
From September 29, 1862, to September 29, 1863	2,896
From September 29, 1863, to September 29, 1864	2,725
From September 29, 1864, to September 29, 1865	2,755
From September 29, 1865, to September 29, 1866	2,450
From September 29, 1866, to September 29, 1867	2,815

The yield of butter was affected by the dry weather in some seasons, as my farm was not well watered. As regards the reduction in quantity after 1863, I reared more calves every year afterward, and as the bull calves were nearly all sold for stock purposes they had to be kept well. I also had on an average about 25 cwt. of skim cheese sold every year, and small pigs were fed on the whey and buttermilk, and turned out to grass and sold as "stores," realizing from £23 to £36 per annum profit between buying and selling. My farm was only about 70 acres, and it will thus be seen that there was a large return for the area. I have also heard of places where only 1 or 2 Black cows were kept where the yield of butter was very great, amounting to 14 pounds per cow per week. I have never in my own dairy churned more than 10 to 11 pounds from a fresh-calved cow; but where 20 cows are grazing on a small area there is no chance of very great individual results.

The docility of the breed is remarkable. A stranger may go safely into a herd of cows, but it is not safe to do so where there is a bull, unless accompanied by some person acquainted with its habits. I have a very strong feeling that bulls after they are one year old should be always kept in the house, not only avoiding accidents, but enabling the farmer to regulate the times of calving. The cows stand very quietly to be milked in the yard or in the house, and with their large, full eyes and quiet expression look the very picture of docility. There is no doubt but that the Black breed as now reared are not apt to fatten at an early age, but I have seen instances where, when reared like the improved breeds, they have done so. Still I do not wish to assert that at present they are so profitable for stall-feeding, but I maintain that, looking at the soil, the climate, and the accommodation for them during the winter, they are the only breed that will pay the farmer's rent. Those who have seen a good Black ox well fed have always acknowledged that there cannot be a handsomer animal. Butchers will tell you that the quality of the meat is not to be surpassed, and that the internal fat is much in excess of Shorthorns and Herefords of a similar size.

The usual method of rearing calves is to take the calf away from the cow after a few days, and then give it nothing but skim-milk. When it is able to eat it is given hay and barley or oatmeal, upon which it thrives fairly. But in the month of May or June the poor animal which has never seen grass, and does not know what it is, is turned out into a good pasture, and there, before its tender mouth can properly eat, it loses all its calf flesh, and when the winter comes on it is still lean. My own method was to take away the calf after a few days and give it its own mother's milk for one month, then half new and half skim for a fortnight, and afterwards skim-milk only with a little dissolved oil-cake mixed with a good hay and mangold were given as soon as it was proper, and in the spring cut grass was gradually introduced, so that the calf, when turned out in June, readily ate it. A little milk and water, with crushed oats and some oil-cake, given all the summer. The first winter, turnip, hay, oil-cake, and oats, and then turned out to grass at one year old, strong, useful yearlings with good constitutions. Afterwards they had no corn or oil cake, but the next winter fed on straw and turnips.

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Mr. Griffith Lewis says:

I give my calves a month's new milk: in fact, let them suck the cow. I then wean them, and give them, for two months, skim milk-scalded, and as soon as they will eat it a little hay and oats. I then turn the mount in to grass about the first week in June, and leave them out till the first week in October, when I bring them in at night into an open shed and give them hay and mangels or swedes. I never rear a calf after the 1st of April, as I find the milk becomes too rich and scours them, and also they are not strong enough to be turned out the first week in June. You can make any use of this you like.

Mr. John Richards says:

The way I rear my calves is: I leave them three weeks on the cow; after that they have milk twice a day, and oats, oil-cake, hay, and roots till they are four months old; then they are turned out on grass, but if they are Christmas calves they are kept in till June.

Mr. Richard Thomas says:

Have been busy at the hay yesterday and the day before, or I would have answered your letter sooner. My system of rearing calves is to give them new milk for three weeks, then I give them skim-milk for about three months, with hay, mangels, and crushed oats. The calves I rear from November to March are turned out to grass, the oldest ones in May and the others in June. About the middle of August I give them a drench for the murrain. In October I commence giving them some crushed oats daily. I keep this lot out all the winter in a dry, sheltered field, and in November I begin giving them hay twice a day. The calves that are calved after March I keep in till the following spring, in a yard and an open shed. They have the same quantity of new milk, and about two months skim-milk, and give them hay, mangels, vetches, and oats. In winter they have swedes, hay, and straw. I give them a drench the same time as the others, and have not lost one calf from the murrain this twelve years. I shall be most happy to give you any further information should you require it.

The Black cattle, which were more conspicuously placed before the public in 1871, when the first Herd-Book was published, have improved very much by the exertions of the farmers and by the noblemen who are interested in the result. The breed is now recognized by the Royal Agricultural Society in its exhibition of stock, and will soon attain the perfection of form and weight of the most improved breeds. This arises in a measure from the greater care taken with the stock whilst quite young, to which attention was drawn in the first Herd-Book.

The question of early maturity has been solved satisfactorily where the Blacks have the same treatment as the Shorthorn and Herefords, and Mr. Harvey says he has seen cattle killed for the butcher's stall at two years old which made admirable beef. The Black cattle flourish on a variety of soils, the limestone, the red sandstone, and the clay slate formation making no appreciable difference in the size of the animal. A damp and moist atmosphere suits them very well indeed, at an average temperature of about 52°. I may add that they are very hardy and do well as out-liers, of tolerably well kept; they improve most rapidly when the spring comes on and the early grass begins to grow. I entertain the idea that the Black cattle are the most paying breed now under a farmer's care. The grasses on the permanent pasture are principally clovers, trefoil, cock-grass, the different fescues, timothy, and foxtail. The grasses used in farming rotation are red clover, Dutch clover, rye grass, trefoil, and cock-grass.

The Earl of Cawdor, who is the principal exhibitor of Black cattle in England, and whose animals generally reach 22 to 23 cwt. at Smith-

field, says:
Their prevailing color is black, with long thick hair, long, yellow horns, body even and well shaped. They are hardy in constitution, strong, docile, useful for labor, when necessary, and subsisting on scanty herbage. Their flesh is of excellent quality, the grain, well mixed, and the extra fat more inside than immediately under the skin. The milking properties of this breed are on an average extremely good, each cow giving from 12 to 14 quarts daily. The quantity, quality, color, and flavor of their butter cannot be surpassed. They get to maturity at an early age, but, like every other breed, that depends entirely upon the feeding. Live weight of bulls, 24 cwt.; oxen, 22 cwt.; cows, 18 cwt. The hardness of the breed renders them suitable as out-liers, and they rapidly gain flesh. There is a very satisfactory improvement noticeable in the breed of this cattle, and in a few years more they will claim an honorable position among the varied breeds of Great Britain. The soil here is brownish, light, dry

loam, of good depth, or a sort of mixed limestone, well adapted for growing excellent crops of swedes, mangels, &c., and it will grow heavy crops of oats (black better than white) and barley. The yield of grain is only fair in finding properties. Most sorts of grasses are grown in this neighborhood, but clover is not a certain crop. The climate is damp and changeable, but extremely mild, the spring often late and cold, with a prevailing east wind.

The annual rainfall of the districts occupied by the Black cattle is about twice the amount of that of Chiswick, and the westerly winds are very strong.

Mr. George F. Bowden says :

It requires a hardy race to stand the exposure during the winter to which the Black cattle, without any shelter except the high hedges, are subject, and this quality of hardness of constitution is possessed by the Blacks. In their coats and general appearance they show the first approach of the genial spring. There is no animal which commands so good a price in the fairs as a bullock that has been wintered out in the fields and shows fair condition and a good coat. To those who wish to be possessed of a good herd of Blacks I would say, avoid all attempts at crossing—such attempts have never yet succeeded—but purchase the best pedigree bull of as good a strain as you can get for the money. As to rearing and feeding for milk, a few years ago I purchased some of the best cows to be procured in calf to noted bulls. I was enabled to have this rare opportunity by being acquainted with several of the best breeders. I have tried Shorthorns, and I have had the best of cows procurable for milk and feeding purposes, but I prefer the long horn Black cow, which gives rich milk, thick cream, and makes doef not to be surpassed, quite equal to Scots, and commands as good a price. They drop better and harder calves, and I have never, so far, lost a calf. I have had cows calve about November and December, and all times of the year. I keep the cow and calf in for, say, one month and then turn them out. They stand the winter wonderfully well, and will do well on hay and chop; sometimes I use turnips and rice meal. I never tie up any only those I milk and finish off for the butcher. Some calves I have reared upon their mothers' milk, and I do not know whether this does not pay best in the long run, and is more natural. The calves reared in this way at one year old are as big and have better hair and coats than those reared by hand at two years old. I do not believe in allowing the calf to suck the cow and keeping the calf in the shed, but rather in allowing it to have its freedom with its mother on the grass. It then learns to eat with her, and when they are separated it does not feel so much the loss of the mother's milk, and is better prepared to get its own living. Other calves I rear on skim-milk, calf meal, and a little dissolved oil-cake. I find that new milk for one month is the best way to start a calf. After four months I begin to give them chop, rice-meal, and linseed-cake, and continue this through the winter, all given out of doors. I find that for feeding purposes it best answers to buy barren heifers and bullocks turned three years old. If bought at two years old they want summering and wintering in the sheds on turnips, hay, rice meal, Indian meal, and linseed-cake, and then they come out good ones at three years old and very fit for the butcher. This is my experience, having bought several trucks for myself and others. If it pays the Welsh farmers to keep this class of cattle on poor land and poor feed, surely they ought to do something on good land and good feed.

HETCHIN ENGLAND, 1883-'84.

JAMES LONG.

SELECT BREEDS OF BRITISH CATTLE.

REPORT BY CONSUL PACKARD, OF LIVERPOOL.

INTRODUCTORY AND EXPLANATORY.

I have the honor to acknowledge the receipt of circular dated July 18, 1883, in reference to the breeding cattle in this country and requesting me to report upon the same.

The difficulty of collecting reliable information has been very great. This consulate being far removed from the agricultural and farming districts has necessitated the writing of a large number of letters to

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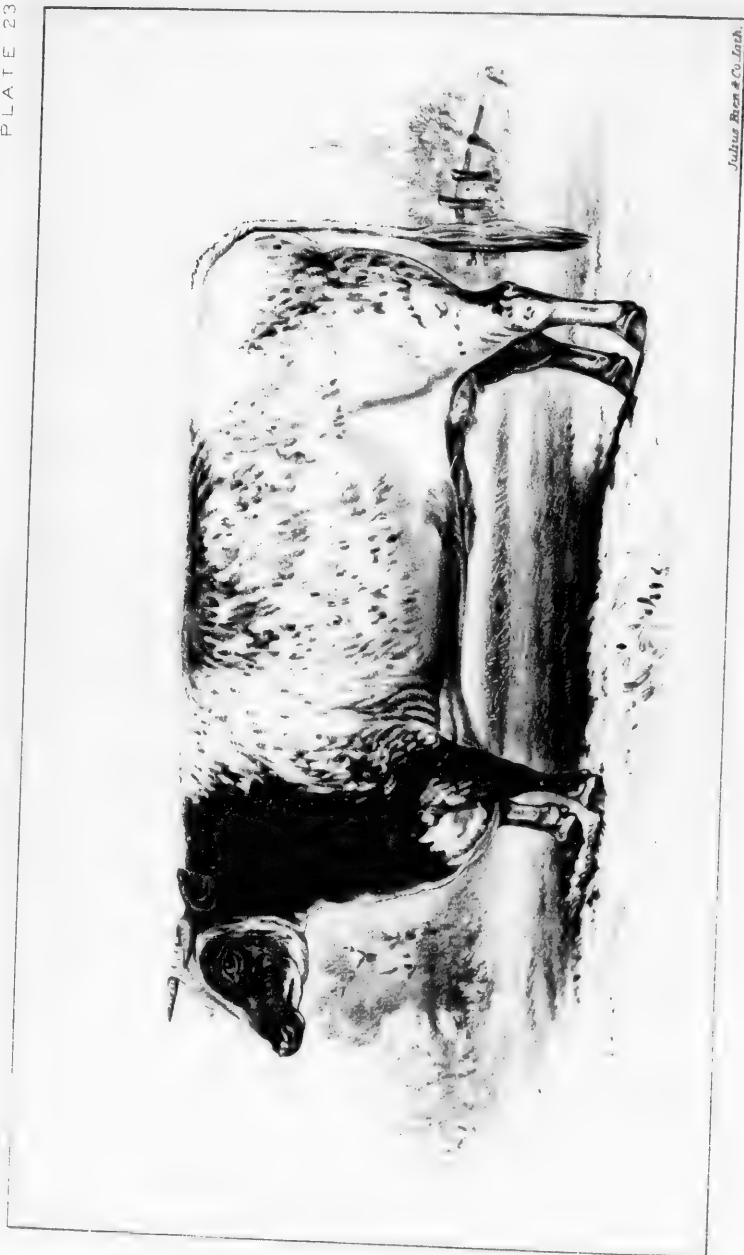
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prominent breeders. In many cases the breeders excused themselves answering the questions on account of their voluminous nature. For much of the information I have been able to obtain I am greatly indebted to Mr. George de la Perrelle, of Litherland, near Liverpool, a well-known shipper of select stock for breeding purposes to Canada and the United States.

There are in this country numerous breeds of cattle, but as a number of these are considered of inferior sorts, I have thought it best to report only of such breeds as excel in merit for the dairy or beef-making purposes, and at the same time suitable to our climate and soil, such breeds as are usually selected by the buyers who come over here to secure those best adapted for exportation to the United States. They are as follows: Shorthorns, Devons, Sussex, Herefords, Red Polled, Polled Angus or Aberdeen, Welsh, Jerseys, and Ayrshires.

THE SHORT-HORN CATTLE.

Some of the best herds of this celebrated breed are to be found in Yorkshire and the north and northwest counties of England, but more or less all over Great Britain.

The following descriptions of the Short-horn and other breeds hereinafter treated are more or less borrowed from eminent English writers on cattle, and suggest strongly the points of excellence which should be considered by the buyer of thoroughbred neat stock.

This breed possesses, in an eminent degree, a combination of qualities, and are rendered attractive to the eye by their splendid frames and beautifully varied colors; they have become objects of public curiosity, and have realized for their breeders enormous sums of money.

The following may be taken as a fair specimen of a Yorkshire cow:

A milch cow, good for the pail as long as wanted, and then quickly got into marketable condition, should have a long and rather small head; a large-headed cow will seldom fatten or yield milk. The eye should be bright, yet with a peculiar placidness and quietness of expression; the chaps thin and the horns small. The neck should not be so thin as that which common opinion gives to this milch cow. The dewlap should be small; the breast, if not so wide as in some that have an unusual disposition to fatten, yet far from being narrow, and it should project before the legs; the chest to a certain degree fleshy; the girth behind the shoulder should be deeper than is usually found in the Short-horn; the ribs should spread out wide so as to give as globular a form as possible to the carcass, and each should project farther than the preceding one, to the very loins. She should be well formed across the hips and on to the rump, and with greater length there than the milker generally possesses, or, if a little too short, not heavy. If she stands a little long on the legs it must not be too long. The thighs somewhat thin, with a slight tendency to crookedness; the tail thick in the upper part but tapering below, and should have a mellow hide and little, coarse hair. The quantity of milk given by some of these cows is very great, and no uncommon thing to yield thirty quarts per day in early summer, but the average may be estimated at twenty-two to twenty-four quarts. It is said that this milk does not yield a proportionate quantity of butter, and that although these cows may be valuable when the sale of milk is the prime object, they will not answer for the dairy. That their milk does not contain the same proportionate quantity of butter as that of the Long-horns, the Scotch cattle or the Devons is probably true, but more than compensated by the additional quantity of milk.

It also appears that they accumulate flesh and mature more rapidly than any other breed, and, in consequence, take the foremost rank of all neat cattle.

The colors are roan, white, red, and white and red.

Animals.	Average weight at maturity.	Average size at maturity.	
		Girth.	Height.
Cow.....	<i>Cwt.</i> 16 to 18	<i>Inches.</i> 90 to 100	<i>Inches.</i> 56 to 60
Bull.....	18 to 20	90 to 110	58 to 64
Ox.....	20 to 22	90 to 110	58 to 64

Age at maturity: Three years.

How long bred pure: Supposed to be descended from the white cattle of Great Britain. Improvement of breed began about the year 1780.

Annual average pounds of milk: 11,500 pounds.

Milk to pounds of butter: 40 pounds to 1 pound butter.

Product.	Quantity.
Meat.....	
Milk.....	Two-thirds of gross weight. 12,500

Labor: Little.

Method of housing: Young stock are housed from November to March, and fat and milch cows are housed at night from October to May.

Feeding: Fed in the morning with hay, roots, and oil-cake and Indian meal, then turned out on the pasture.

Breeding: Commence at two and one-half years.

Grasses: Rye-grass and clover.

The following are some of the live weights of fattened cattle of this breed:

Oxen exceeding 3½ and not exceeding 4 years old: No. 1, 2,029 pounds; No. 2, 2,164 pounds; No. 3, 2,395 pounds; No. 4, 2,510 pounds; No. 5, 2,424 pounds; No. 6, 2,149 pounds; No. 7, 2,184 pounds; No. 8, 2,296 pounds.

Steers exceeding 2½ and not exceeding 3½ years old: No. 1, 1,715 pounds; No. 2, 1,883 pounds; No. 3, 1,666 pounds.

Cows: No. 1, 4 years 2 months old, 1,874 pounds; No. 2, 4 years and 2 months, 2,022 pounds; No. 3, 4 years and 9 months, 1,604 pounds; No. 4, 9 years and 8 months, 2,177 pounds.

Decrease: In consequence of the high price of meat a large number of prime 2-year-old heifers are being slaughtered, thus decreasing the number of animals.

Prices.—Prices of animals of this breed vary very much, and range from \$125 to \$5,100, according to pedigree. Prices have declined ever since the great sale at New York Mills, Oneida County, New York, in 1873. In order to compare prices which were realized at that sale with those of a recent and important sale of Short-horns in this country at Castle Hill Cerne, it is reported to me that at the former sale 93 cows, heifers, and calves realized the average price of \$3,761.78 each, and 16 bulls at \$1,922.81 each, while at the latter sale 32 cows realized \$900 each (average), and the 6 bulls averaged \$1,372. Seven Dukes and Duchesses averaged \$3,625, and 4 Oxfords \$1,105.

The soil of Yorkshire is for the most part black and brown.

The substratum in some districts is clay, in others rock and gravel.

The temperature in summer is 62° and in winter 37°, the mean during the year being 49°.

DEVON CATTLE.

This breed is found in Devonshire and surrounding counties, and also in Ireland. Little is known respecting its origin further than that in

Average size at maturity.

Girth.	Height.
<i>Inches.</i>	<i>Inches.</i>
90 to 100	56 to 60
90 to 110	54 to 64
90 to 110	58 to 64

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the earliest records it can be traced as the peculiar breed of the county from which it takes its name. They belong to the "middle-horned variety," and in the opinion of some are the most suitable for paying from an all-round point of view; they are very quick feeders, and the high price of the Devon meat shows they are most salable animals—just equal to the Scotch—and that more per acre can be made from Devons at less cost and care. Those reared in the north of the county (Devonshire) are noted for their rich curly coat, but this they frequently lose when taken away from their native home. They, however, bear the change of climate and soil well, thrive where many breeds would starve, and rapidly outstrip most others when they have plenty of good pastures.

Those in the south of the county, known as the "South Hams breed," from the district from which they are bred, appear to be a mixture of North Devons with the Guernsey and are large framed, coarse boned, good milkers, with hardy constitutions and large offals. According to some the North Devon differs from the South Devon in everything which is necessary to constitute a good animal. Each breed, however, has its own particular merits, each answering a better purpose than the other according to the climate, soil, situation, and other circumstances in which it may be placed. The Devon breed is most valuable for its aptitude to fatten, delicacy of touch, and the choice quality of its beautified, veined, and marbled beef, the especial favorite of the butcher (who has a select family trade), for carrying the most beef in the most valuable parts, and for lightness of offal they stand unrivaled. The first herd-book was issued in 1851.

Description.—The general form of the Devon is very graceful, and exhibits a refined organization of animal qualities not surpassed by any breed. The head should be small, with a broad indented forehead, tapering considerably toward the nostrils; the nose of a creamy white; the jaws clean and free from flesh; the eye bright, lively, and prominent, encircled by a deep orange-colored ring; the ears thin; the horns of the female long, spreading, and gracefully turned up, tapering off towards the ends. The horns of the male are thicker set and more slightly curved, or in some instances standing out nearly square, with only a slight inclination upwards.

The color of the true Devon is a pure red.

Animals.	Average weight at maturity.
.....	cwt
.....	lbs
.....	do
.....	do

Notes.—Stoers, four years; cows for breeding, four to six years.
pure: Aboriginal breed; special attention given to the breed since 1851.

In reference to the milk of the Devon cows, Col. J. J. Davy reports (1st November, 1883):

A friend of mine last week tested one day's milking of his 40 cows, which give 17 2/3 tons milk, which made 61 1/2 pounds of whole milk cheese. His neighbor's 40 cross-bred cows gave 61 gallons of milk, which produced only 56 1/2 pounds of whole milk cheese. All the cattle were similarly kept.

From this it appears that 40 pure-bred Devons yielded 470 pounds milk, which gives 61 1/2 pounds whole milk cheese, while 40 cross-bred

Devons yielded 610 pounds of milk, weighing over 500 pounds whole milk cheese.

Meat	
Milk	
Cheese	

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The following are some of the recorded weights of this breed:

Devon steers not exceeding 3 years old: No. 1, 1,568 pounds; No. 2, 1,349 pounds; No. 3, 1,294 pounds; No. 4, 1,197 pounds; No. 5, 1,138 pounds; No. 6, 1,285 pounds; No. 7, 1,321 pounds.

Devon cows: No. 1, 5 years old, 1,211 pounds; No. 2, 5 years and 8 months old, 1,333 pounds; No. 3, 5 years 1 month old, 1,420 pounds.

Devon heifers under 4 years old: No. 1, 1,276 pounds; No. 2, 1,153 pounds; No. 3, 1,284 pounds; No. 4, 1,079 pounds.

The price is various, but moderate when compared with those of other breeds.

The surface of North Devon, where this breed is found in the greatest purity, has moorish, mountainous grounds on the east and west, but presents over the most parts a rich display of varied contour, fertility, and beauty.

The soils are mainly pure yellow or white clays, and partially clayey loam.

The substratum is old red sandstone or Devonian rocks.

The temperature in summer is 60° in water at 10°; the mean during the year 51°.

SUSSEX CATTLE.

This breed is to be found principally in the counties of Sussex, Kent, and Surrey.

The progress made in recent years by Sussex stock has proved it to be one of the most profitable of breeds. The "milk and meat" very rapidly, perhaps more so than any other breed, and their admirers are pleased to state that this was clearly demonstrated in 1878 at the Southfield Club cattle show. The first herd book was published in 1860. The color is red.

Cow .....	.....
Butt .....	.....
Oil .....	.....

Age at maturity: Two to 3 years.
 Annual average pounds of milk: About 1,000 pounds.

The annual yield of butter is about 200 pounds.

The price varies according to quality. Cows from \$88 to \$97.

The county of Sussex is described as a maritime county. It contains but few hills, none of which obtain 1,000 feet high.

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CHERMA, AT 5 YEARS 2 MONTHS OLD

PERMAN, AT 4 YEARS 2 MONTHS OLD



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HEREFORD BULL

Volume 10, No. 1, 1914

HEREFORD BULL



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The soil generally compares with the underlying rocks, and varies from sterile sand to very stiff loam.

The substratum is lower greensand rocks, chalk, and lower Eocene rocks.

The temperature is 63° in summer, 38° in winter, and the mean temperature 50°.

HEREFORD CATTLE.

This breed takes its name from the county where they were first bred, but they are to be found also in the adjoining counties. They are also grazed in most of the great grazing farms of the midland counties, and there are also breeding herds in Scotland and Ireland. The Queen's celebrated herd is kept near Windsor, Berkshire. This breed adapts itself easily to the severe climate of the north, as well as the milder climate of the south.

In America some are to be found in ranches 6,047 feet above the level of the sea, and no better proof can be given of the hardiness of the Herefords.

Of this breed the Earl of Coventry says:

I have observed Hereford cattle for twenty years, but I only commenced forming a herd nine years ago. During that period I have tried them alongside pedigree Short-horns and other breeds of cattle, and I am so satisfied of the superiority of the Hereford breed for feeding purposes that I have disposed of other sorts. They are a hardy breed, doing well out of doors all the year round. Their quality of meat is very superior; they have less "rough" meat about them than the Short-horn, hence first-class butchers prefer them to other sorts. (21st October, 1883.)

They are a perfectly pure race of cattle and have been brought to their present excellence by the judicious selection of both male and female animals, and not by the introduction of crosses of other breeds. This strictly pure blood gives them the great value they have for improving other breeds.

Color.—The distinguishing color is red with a white face, chest, and belly, white flank and white tip to the tail; white on the legs, white mane, and often white line along the back. The red with white face is invariable, and the white predominates, more or less, on different animals. There are also gray Herefords, but these are now confined to one or two breeds.

The date of the first herd-book is 1845.

Increase.—The demand for exportation principally for the United States and Canada has increased the stock of the district, owing to more farmers breeding.

Animals.	Average weight at maturity
Cow.....	12 to 14 cwt.
Bull.....	16 to 20 do.
Ox.....	20 to 22 do.

Age at maturity: Three years.

How long bred pure: From a very remote period.

Annual average pounds of milk: Nine thousand five hundred pounds

Milk to pounds of butter: Thirty pounds to 1 pound of butter

H. Ex. 51—11

A good cow has been known to yield 14 pounds of butter per week at grass; and also one gave 55 pounds of milk, yielding $2\frac{1}{2}$ pounds of butter per day, but this is of rare occurrence.

Product.	Quantity.
Meat.....	pounds..... 1,770
Milk.....	do..... 9,500

Labor: Little or none.

Method of housing: Open yards during winter, with a run out by day; summer out in rough pasture.

Feeding: Hay, straw, and roots in winter; rough pasture in summer.

Breeding: Heifers have calves at two and a half years, and continue to breed till they are old.

Grasses: Clover, rye-grass, meadow, fox-tail, and English natural grasses.

The following is a record of the live weights of the fatted cattle of this breed:

		Oxen (over 2½ and not over 4 years old).	Steers (over 2½ and not over 4 years old).	Heifers (not over 4 years old).
	pounds			
No. 1.....		2,294	1,724	1,621
No. 2.....	do	2,115	1,662	1,564
No. 3.....	do	2,024	1,884	1,855
No. 4.....	do	2,500	1,778	1,823

No. 1 ox (represented in the sketch) is the property of Mr. J. Price and was the winner of the Elkington challenge cup, which has never been done except by this Hereford. He is the true type with the markings for the Hereford.

Price.—At the recent total dispersion by auction of two old established herds the average price was just \$375, including cows, bulls, and suckling calves. At one sale the leading bull sold for \$4,139; at the other sale 12 two-year-old heifers averaged \$652 each; the highest priced cow was \$1,329. There were 117 animals in one sale and 91 in the other.

The soil of Herefordshire is various, from clay to light sandy soil, much of which is of inferior quality.

The substratum is principally lime stone, clay, and gravel.

The temperature at the altitude of 100 to 300 feet above sea level is in summer 60°; in winter, 39°; the mean during the year, 49°.

RED-POLLED CATTLE.

This breed of cattle is found principally in the counties of Norfolk and Suffolk, and its history can be carried far back into the last century. Formerly there were two varieties, and it is only since the year 1846 that the amalgamation of the two varieties, previously known as the Norfolk Polled and Suffolk Polled, has taken place, and the breed is at present known as the Suffolk and Norfolk Polled. Many of the old Suffolk Polled cattle were much more massive than the Norfolk, and this characteristic is yet in evidence. They could easily be picked out from a collection by the comparative coarseness at the head, a difference which is now but seldom manifest. In other points there were few divergencies in character between the two varieties.

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RED POLLED BULL



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RED POLLED COW



Indian River, Fla. 1918



RED BULL DOG

Red-Polled cattle are found to lay on flesh rapidly on pasture of the poorest quality where other breeds would require an additional supply of richer food. The dry temperature of their native home and the poor pasture seem more particularly to have their effect on the size of the stock.

As graceful as the Devon, the Red-Polled has the additional advantage of being hornless, in itself no little gain where horses also run in the pastures, or where the stock sent to market have to make a long journey by railway, boat, or road.

The first herd-book was issued in 1874.

The color and description of the breed, agreed upon by breeders in the autumn of 1873:

The color red, but the udder may be white. The extension of the white of the udder a few inches along the inside of the flank, or a small white spot or mark on the under part of the belly by the milk veins, shall not be held to disqualify an animal whose sire and dam form part of an established herd of the breed, or answer all other essentials of the standard description.

Form.—There should be no horns, slugs, or abortive horns.

The following are the points for a superior animal:

Color.—A deep red with udder of the same color, but the tip of the tail may be white, nose not dark or cloudy.

Form.—A neat head and throat, a full eye, a tuft or crest of hair should hang over the forehead; the frontal bones should begin to contract a little above the eye and should terminate in a comparatively narrow prominence at the summit of the head. In all other particulars the commonly accepted points of a superior animal are taken as applying to Red-Polled cattle. Clean, thin, short legs; a clean throat with little dewlap; a springing rib, with large carcass; a large udder, loose and creased when empty; milk veins very large and rising in knotted puffs to the eye, are points in a good Red-Polled cow.

Animals.	Average weight at maturity.
Cow.....	12
Bull.....	16
Ox.....	14

Age at maturity: Four years.

How long bred pure: One hundred years.

Annual average pounds of milk: 11,250 pounds.

Milk to pounds of butter: 35 pounds to 1 pound butter.

Product.	Quantity.
Meat.....	
Milk.....	1,072
Cheese.....	11,250
	396

Labor: Little.

Method of housing: In pasture.

Feeding: Grass, carrots, and beet roots, turnips and cake.

Breeding: Commence at two years.

Grass: Clover and rye grass; no timothy.

WEIGHTS OF DEVON CATTLE.—The following are some of the weights of live cattle of this breed, as recorded by Mr. Euren:

No.	Age.	Weight.	Length from point to shoulder.	Total length.	Girth.
	<i>Years.</i>	<i>Pounds.</i>	<i>Ft. In.</i>	<i>Ft. In.</i>	<i>Ft. In.</i>
1.....	9	2,093	5 2	7 10	7 10
2.....	5	1,314	4 9	6 9	6 9
3.....	5½	1,320	4 6	.....	6 4
4.....	6	1,436	4 11	.....	6 8
5.....	6	1,427	5 0	.....	6 7
6.....	3	1,281	.....	.....	.....
7.....	3	1,354	.....	.....	.....
8.....	7	1,514	5 0	.....	6 8
9.....	8	1,650	5 2	.....	6 6
10.....	3	1,350	.....	.....	.....
11.....	6	1,472	.....	.....	.....
12.....	9	1,649	.....	.....	.....
13.....	3½	1,358	4 8	6 7	6 9
14.....	5	1,367	4 7	.....	6 7
15.....	2½	1,484	4 11	6 10	7 1

Also average daily yield of milk in pounds:

No.	Date of calving.	September.	October.	November.	December.	January.	February.	March.	April.	To May 21.
1.....	Fourth calf August 28.....	50	49	47	45	43	42	40	33	20
2.....	Second calf September 7.....	52½	51	50	49	46	43½	44	40	32½
3.....	Third calf December 17.....	.....	.....	.....	42½	40½	40	39	38	35
4.....	Third calf January 4.....	.....	.....	.....	.....	47½	45	43	42	40

Another test gave a daily average for five months of 51.30 pounds; for six months, 50.1 pounds; for seven months, 48.76 pounds.

Total from September 1 to March 31, inclusive, 10,341 pounds; to April 30, 11,196 pounds.

Decrease of stock.—This has in a great measure arisen from the fact of rinderpest having a few years ago been fatal to a large proportion of the cattle then in noteworthy herds. Fashion also has had a marked effect. Short-horns and Devons were at one time in such favor that polled cattle were despised and their merits ignored. There is, however, at present a marked progress made in the breed; shortness of numbers is being in some measure compensated for, noblemen and gentlemen now sparing no pains to make the breed a success.

Prices are from \$195 upwards, according to pedigree.

The soil of Norfolk may be divided into three classes: Light sands of various qualities, low alluvial clays and loams, and loams of various qualities, chiefly light incumbent on a marly clay. Suffolk is nearly covered by diluvial beds.

The surface is gently undulating except along the northwest and some parts of the northeast border, where it subsides into low, marshy levels.

The temperature of this part of England is 62 degrees in summer, 37 degrees in winter, and the mean during the year 49 degrees. The climate is somewhat colder than that of the southern and western counties.

THE ABERDEEN OR POLLED ANGUS CATTLE.

This breed is principally to be found in the northeastern counties of Scotland, Forfar and Aberdeen being the chief centers, and it has existed

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January.	March.	April.	To May 21.
40	33	26	
44	40	32	
39	38	31	
43	42	40	

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POLED ANGUS BULL





WATERBURY, N.H.

there from time immemorial, but it was only in the year 1808 that some attention was given to improve it.

The first herd-book came out in 1862, and since that time the breed has greatly improved and has become somewhat famous for the excellent quality of its beef, which, according to some admirers, stands pre-eminently forward, both to the farmer and butcher, as being hardy and healthy, good milkers both in quantity and quality, easily fed, good beef producers, coming early to maturity, and highly prized by butchers. The color is black.

The description of a fine type of a Polled Angus is: The head of a male should not be large, but should be handsome and neatly set on. The muzzle should be fine, the nostrils of only moderate length, the eyes mild, large, and expressive; the poll high, the ears of fair size, lively, and well covered with hair, the throat clean, with no development of skin and flesh beneath the jaws, which should not be heavy, the neck pretty long, clean, and rising from the head to the shoulder top and surmounted by a moderate "crest," which contributes to masculine appearance, a desirable point in a bull. The neck should pass neatly and evenly into the body, with full neck vein. The shoulder blades should lie well backwards, fitting neatly into the body, and not lying awkwardly outside it; they should show no undue prominence on the shoulder top, on the points, or at the elbow. The chest should be wide and deep, the bosom should stand well forward between the fore-legs, and underneath should be well covered with flesh and fat. The crops should be full and level, with no falling off behind them; the ribs well sprung, neatly joined to the crops and loins; the back level and broad, the loins broad and strong, the hook-bones not too wide, narrower than in an average Short-horn; the quarters long, even, and rounded; the tail should come neatly out of the body, not too far up the back and not higher at the root than the line of the back.

The above description refers more correctly to bulls than to cows; the latter, of course, differ considerably in character; the head is much finer, the neck thinner and cleaner, with no "crest;" the shoulder top sharper, the bone altogether finer, the skin not quite so thick; the udder large, and milk vessels large and well defined.

Animals.	Average weight at maturity.
Cow	14
Bull	18
Ox	15 to 16

Age at maturity: Three years.

How long bred pure: Seventy years.

Annual average pounds of milk: 9,000 pounds.

Milk to pounds of butter: 27 pounds to 1 pound of butter.

Product.	Quantity.
Meat	1,456
Milk	9,000

Labor: Little.

Method of housing: In covered courts and stalled in winter, pastures in summer.

Feeding: Grass, turnips, straw, and cake.

Breeding: Two years of age.

Grasses: Clover and rye grasses.

Weight.—The following are some of the weights of fatted cattle of this breed: Steers not exceeding four years old, No. 1, 2,268 pounds; No. 2, 2,065 pounds; No. 3, 1,974 pounds; No. 4, cow, three years and eight months, 1,876 pounds; No. 5, three years, 1,710 pounds. Cattle intended for the London Christmas market are kept till three or four years old, and 1,232 pounds to 1,456 pounds (dead weights) are common weights.

There is no apparent scarcity of stock.

Price.—The average price realized at recent sales has been \$180, and the highest price that has been paid for a polled animal was \$1,385 in 1880.

The climate of the county of Aberdeen is described as on the whole mild, the winters not being so cold nor the summer so mild or so long as the southern counties.

The temperature is 57° in summer, 36° in winter, and the mean during the year 45°.

The soil on the uplands is very poor and thin, while the low-lying land has various soils, but most of it naturally poor and churlish, but has by judicious cultivation been converted into fine mold. Heaths and coarse, stiff clays are common in the higher districts, and light sands and fine clay in the valleys.

WELSH CATTLE.

There are two breeds of cattle in Wales. The North Wales breed is found in greatest perfection in Anglesea and Caernarvonshire. The South Wales breed is called the "Castle Martin" and the animals are very big, large bones and coarse, but they are not in favor in the north of the principality. The first herd-book for North Wales was published last year (1883), and great care and attention is now being given to the breed.

Color.—Both breeds are black, producing occasionally specimens of dun-colored and red. Characteristic points require that bulls should have white testicles and the cows white udders.

Age at maturity, 3½ years.

Live weight (average) at maturity is, cow, 13 to 14 cwt., bull, 15 to 18 cwt., and the ox 13 to 15 cwt.

The following are the weights of three oxen under four years of age: No. 1, 1,870 pounds; No. 2, 1,953 pounds, and No. 3, 2,108 pounds. The ox whose photograph is given herewith weighs actually 2,461 pounds and won the chief prize, "the breed cup" at Smithfield cattle show, 10th December, 1883.

Milk yield from a good cow is about 4,000 pounds annually; butter yield is about 300 pounds annually; no cheese is made.

Price.—The average price for good oxen is from \$88 to \$98.

The Isle of Anglesea (where this breed is found pure) is described as being quite devoid of mountains or glens, flat in the south and center and only moderate hills on the north. The climate is mild but foggy, the temperature being 59° in summer, 42° in winter, and the mean during the year 50°. The soils are chiefly sandy loam, a stiff reddish earth, and blackish vegetable mold. The rocks are Cambrian, Lower Silurian, Lower Carboniferous, limestone and shale, granite, Permian conglomerate, sandstone, and red marl.

THE JERSEY CATTLE.

Jersey is justly celebrated for its breed of cattle, which goes under the name of the Alderney breed. There are about 12,000 cattle on this

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JEPSEY BULL

JERSEY COW



small island, which is only 12 miles long by 6 miles broad, and, what is most remarkable, it exports every year above 2,000 head of cattle.

The Jersey cow is specially adapted for the dairy, yielding a quality of milk so rich that no other can be compared to it. But the speciality is butter, and in this it stands unrivaled for quality and profit.

Description.—The head should be small, slender, and lengthy from the eye to nose; the horns thin and open, not cramped or too curly; the eye full but not too prominent; the ear lengthy and broad and well fringed with hair; a broad muzzle should be avoided; the neck should be long, flat, and narrow, with a tendency to rise at the withers, and breadth behind the arm to allow of a full expansion of the lungs, the chest being rather deep than broad. The flat-sided cow is more especially to be chosen as a milker; the hips should be wide, rugged, and high, and the haunches wide and large, drooping toward the tail; the thigh long and lean from hip to hock, the veins being prominent and easily felt; the legs slender with flat bone and small, flat feet, the hinder ones having good width between, to afford room for the udder; a long and thin tail is a great point in breeding.

This is a general description of the breed, but the Jersey Agricultural Society have a standard of points by which they judge an animal.

Color.—They are gray-fawn and white, yellow-fawn and white, gray-dun and white, gray and white, silver-gray dun, cream-color fawn, &c.

Animals.	Average weight at maturity.
Cow.....cwt..	8
Bull.....do..	12
Ox.....do..	Rare.

Age at maturity: Four to five years.

How long bred pure: Five hundred years.

Usual average pounds of milk: Seven thousand.

Milk to pounds of butter: Twenty pounds to 1 pound butter.

Milk to pounds of cheese: None made.

Product.	Quantity.
Meat.....pounds..	750
Milk.....do..	7,000
Cheese.....do..	None.

Labor: Little or none.

Method of housing: Housed at night and tethered by day.

Feeding: Grass, turnips, &c.

Breeding: Commence at about sixteen months

Grass: Trefoil, Lucerne, clover, rye.

The following are some of the famous yields of Jerseys as published by Mr. E. P. Fowler, of Southampton:

Yield of butter per week when in full flow.

Number.	Quantity.	Number.	Quantity.
	<i>Lbs. oz.</i>		<i>Lbs. oz.</i>
1.....	28 0	8.....	18 0
2.....	20 13	9.....	17 0
3.....	20 0	10.....	17 0
4.....	19 8	11.....	16 13
5.....	19 0	12.....	16 0
6.....	18 12	13.....	15 12
7.....	18 4	14.....	14 0

Cream test, 52 degrees.

Decrease of stock.—Rinderpest or foot and mouth disease has never appeared in the island. The decrease is owing to the great number exported of late years to America, where the breed is highly prized.

Price.—From \$200 to some thousands, according to pedigree.

Topography.—The surface of the island is everywhere undulating. The high land consists, for the most part, of granite rocks; the southern part, of a mass of schistose rocks incumbent upon granite.

Temperature.—The climate of Jersey from its insular situation is milder than that of other places under the same latitude, and the mean temperature, which is 53°, is higher than that of any part of England. In summer it is 61°, and in winter 42°.

AYRSHIRE CATTLE.

This breed is found in Ayrshire, Scotland (whence it derives its name), and the adjacent portion of the Lowlands. It is an admirable breed of milch cattle, rather under the middle size, but hardy, and yielding excellent milk in large quantities.

Description and color.—The improved cow has the head small, but rather long and narrow at the nozzle, though the space between the roots of the horns is considerable; the horns are small and crooked; the eye is clear and lively; the neck long and slender and almost destitute of a dewlap; the shoulders are thin and the forequarters generally light; the back is straight and broad behind, especially across the hips, which are roomy; the tail is long and thin; the carcass is deep; the udder capacious and square; the milk vein large and prominent; the limbs are small and short, but well knit; the thighs are thin; the skin is rather thin, but loose and soft and covered with short hair; the general figure, though small, is well proportioned; the prevailing color is mottled red and white.

Product.	Weight.
Annual average production of milk.....	pounds..... 9,000
Milk to pounds of butter.....	do..... 35
Milk to pounds of cheese.....	do..... 16
Average weight at maturity:	
Cow.....	cwt..... 12
Bull.....	do..... 16
Ox.....	do..... 18

Age at maturity: Four to five years.
How long bred pure: One hundred years.

Product.—A good cow will yield from 9,000 to 16,000 pounds milk. This milk is calculated to return about 250 pounds butter or 500 pounds cheese per year.

Treatment.—The cows are treated by enterprising farmers as follows: They are kept constantly in the byre (or shed) till the grass has risen to afford them a full bite. Many put them out every good day through the winter and spring, but they poach the ground with their feet and rip up the young grass as it begins to spring, which, as they have not a full meal, injures the cattle. Whenever the weather becomes dry and hot the cows are fed on cut grass in the byre from 6 in the morning to 6 in the evening and turned out to pasture the other hours; when rain comes the house feeding is discontinued; when pasture grass begins to fail in harvest they receive a supply of the second growth of clover, and afterwards of turnips strewn over the pasture ground; when the weather becomes stormy in the fall of the year the

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cows are kept in the byre during the night, and in a short time afterwards both night and day; they are then fed on oat straw and turnips; they continue to yield a considerable quantity of milk for some time; part of the turnip crop is eaten at the end of harvest and beginning of winter to protract the milk, and part is stored up for green food during the winter; after this store is exhausted the "Swedish" turnip and potatoes are used along with any fodder till the grass can support the cows. Chaff, oats, and potatoes are boiled for the cows after calving, and they are generally fed on rye grass during the latter part of the spring.

Price.—The average price for good cows is from \$122 to \$146.

The county of Ayrshire is for the most part plain open country, neither hilly nor level, but rising from the shore in a gradual easy acclivity till it terminates in mountains on the southeast, and moorish hills on eastern boundaries. No part can be termed level, for the surface abounds with numerous swells and roundish hills which facilitate the escape of moisture and promote ventilation.

Climate.—For more than two-thirds of the year the wind blows from the southwest, and the rains are often copious and sometimes of long duration. The temperature is 59° in summer, 37° in winter, and the mean during the year 47°.

Soils.—Clay, or argillaceous earth, is the most common. This species is so tenacious that it can only be plowed in a state of moisture, but by application of lime and other manure it is convertible into fine rich loam, thousands of acres having been thus treated. Loam of alluvial formation is found in holms on the sides of rivers and other low situations. The substratum in the higher parts of the county abound in unmixed granite, while also is found breccia whins-tone, greenstone, and red sandstone.

EXPORTATION OF BRITISH CATTLE TO THE UNITED STATES.

All of the breeds here treated are said to have greatly improved in the United States, where the conditions of climate and soil have been favorable.

The best animals to import are the pure breeds, and choice should be made according to the needs and fancy of the importer and the circumstances of the climate, &c., of his grazing lands.

For dairy purposes, having regard to cost of keeping, the preference seems to be for the Alderney, Ayrshire, and Welsh, while the Short-horn and Red-Polled excel both for milk and beef producing qualities. As a general farm stock the Devon, Hereford, Polled, Aberdeen or Angus, and Sussex are pre-eminently admired for beauty, size, and flesh-making qualities.

As to the best methods, best routes, and cost of transportation, Mr. De la Perrelle writes as follows:

The loss through mortality, an important item, I have found can be overcome by profiting by the experience of practical shippers. My experience, which has extended over many years, has proved that personal and practical attention is amply repaid by the fact that the loss of cattle shipped by me has not exceeded 1 per cent. Many shippers find, therefore, difficulty to obtain marine insurance, and the rates rule high from the fact of their not attending and insisting upon the details of properly stalling cattle on board steamers, cheapness in this particular being false economy.

As to the route, some are shipped from London, Southampton, Bristol Channel, Liverpool, and Glasgow, but I would give the preference to Liverpool, as I consider it offers greater facilities for shipping than any other port. The freight per head is from \$25 to \$35, according to destination, but I ship sometimes at a much lower rate when there is a large number of animals to ship, and I reckon the cost of food en route for pedigree stock to be about 36 cents per day.

WHERE TO PURCHASE BRITISH CATTLE.

The following may be of interest to intending purchasers as showing the places and dates where most of the animals of the reported breeds may be seen and purchased:

West Highland and Scotch cattle generally are shown in large numbers at Falkirk trysts (or fairs) second Monday in September and October, when from 20,000 to 30,000 are shown; at Muir of Ord fairs, Inverness, and all Scotch fairs; also at Newcastle October fairs; at Stagshaw, in the same county; at Brough Hill, Westmoreland; at the Norwich markets, and at Barnet fair on the first week in September, and Worthington August 26.

Galloways are met with at all the fairs in south and west of Scotland; at Carlisle, Penrith, Rosley Hill on Whit Monday, Brough Hill, and Newcastle fairs.

Shorthorns: The fairs at Newcastle-on-Tyne, Durham, Darlington, Yarm in Yorkshire (October 19 and 20), Northallerton, Northampton, Boston in Lincolnshire, Stow-on-the-Wold, Gloucestershire are remarkable in their several districts for this breed. Of these Newcastle, Darlington, and Yarm are probably the best.

Herefords: The best shows of this stock are at the fairs in Herefordshire in the month of October at the great market in Hereford itself, October 20; at Leominster in March and October 27; at the fairs in Monmouth and in Ross great numbers of well-bred animals are shown. Among the other fairs those of Shrewsbury, Wolverhampton, Birmingham, Gloucester, and Barnet in Hertfordshire, are noteworthy.

Devons are shown in their own county at South Molton, Saturday after February 13; Crediton, Saturday before last Wednesday in April; Sampford-Peveril, the following Monday; Exeter, February 10, May 19, July 21, December 8; North Molton, third Wednesday in May and last Wednesday in October; at Barnet fair, first week in September; Boughton Green, Northampton, June 24, 25, and 26.

Sussex cattle are rarely met with out of their own county and its neighborhood (Lewis, May 6).

Channel Islands: One of the best fairs for this stock (Jerseys) is Southampton, Trinity Monday.

Ayrshires are met with in abundance at the fairs in the southwestern counties of Scotland, the principal probably being Ayr (last Friday in April) for cows, barren and in calf, and young cattle.

I have the honor to transmit herewith tabulated summary of the special points of information called for by the Department's form sent me.

STEPHEN B. PACKARD,
Consul.

UNITED STATES CONSULATE,
Liverpool, January 28, 1885.

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ACKARD,
Consul.

Name of breed.	Annual average pounds of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Great Britain.	Live weight.			Age at maturity.
				Habitat.	Cow.	Bull.	Ox.	
Shorthorn	11,500	40		Yorkshire, &c	<i>Cwt.</i> 16 to 18	<i>Cwt.</i> 18 to 20	<i>Cwt.</i> 20 to 22	<i>Years.</i> 3
Douon	6,000			Devonshire	9	12	11	(*)
Sussex	3,000			Sussex, &c	14 to 17	15 to 20	17 to 20	2 to 4
Hereford	9,500	30		Hereford, &c	12 to 14	16 to 20	20 to 22	3
Red Poll'd	11,250	35		Norfolk and Suffolk	12	16	14	4
Angus or Aberdeen	9,000	27		Forfar and Aberdeen	14	18 to 15	15 to 16	3
Welsh	4,000	13		North Wales	15 to 14	15 to 18	15 to 15	3
Jersey	7,000	20		Isle of Jersey	8	12	Rare.	4 to 5
Ayrshire	9,000	35	16	Ayrshire	12	16	18	4 to 5

*Steers, 4 years; cows for breeding purposes, 4 to 6 years.

Name of breed.	Color.	How long bred pure.	Product.			
			Labor.	Meat.	Milk.	Cheese.
				<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>
Shorthorn	Roan, white, red and white, red.	Since 1780	Little	140 of gross weight.	11,500	
Devon	Red	Since 1827	do	1,232	6,000	350 to 500
Sussex	do			3,000		
Hertford	Red and white	From a remote period.	Little	1,770	9,500	
Red Polled	Red	One hundred years.	do	1,072	11,250	336
Angus or Aberdeen	Black	From a remote period.	do	1,456	9,000	
Welsh	Black, and occasionally dun and red.				4,000	
Jersey	Gray, fawn, and white, and various.	Five hundred years.	Little	750	7,000	
Ayrshire	Mottled red and white.	One hundred years.			9,000	500

District.	Mean tempera- ture.	Summer.	Winter.	Soil.			
				Alluvial.	Loam.	Clay.	Sandy, &c.
Yorkshire.....	49	61	37	.....	Loam.....	.....	.....
Devonshire.....	51	60	39	.....	Clayey loam.....	Yellow and white clay.	.....
Sussex.....	50	63	38	.....	Stiff loam	to sterile sand.	.....
Hertfordshire.....	49	60	39	.....	.....	Clay to light sand.	.....
Norfolk and Suffolk.....	49	62	37	Alluvial	Loam.....	Clay.....	.....
Hertfordshire and Aber- deenshire.....	45	57	36	.....	.....	do.....	Sand and va- rious.
North Wales.....	50	59	42	.....	.....	.....	Sandy loam, &c.
Jersey.....	53	61	43	.....	.....	.....	.....
Ayrshire.....	47	59	37	Alluvial	.....	Clay.....	.....

Tabulated summary of the special breeds of British cattle, &c.—Continued.

District	Limestone	Sandstone	Granite	Clay	Gravel &c.	Cultivated grasses	
						Clover.	Rye, grass &c.
Yorkshire		Old red sandstone		Clay	Gravel	Clover	Rye
Devonshire		do				do	Rye, &c.
Sussex	Lower greensand, chalk		and lower	Forest, &c.			
Herefordshire	Limestone			Clay	Gravel	Clover	Do
Norfolk and Suffolk						do	Do
North Wales	Limestone	Sandstone	Granite				
Jersey			Granite &c.			Clover	Rye, trefoil, and lucerne
Ayrshire		Old red sandstone					

District	Method of housing.	Feeding.	Breeding.
Yorkshire	Young stock are housed from November to March. Fat and milch cows are housed from October to May.	Fed in the morning with hay, roots, and oil-cake, and Indian meal, then turned into pastures.	At 2½ years
Devonshire	In pasture.	Grass, turnips, and oil-cake.	At 2 years.
Herefordshire	Open yards during winter, with a run out by day. Summer out in the grass.	Hay, straw, roots in winter, pastures in summer.	At 2½ years.
Norfolk and Suffolk	In pasture	Grass, carrots, beet-root, turnips, and cake.	At 2 years
Forfarshire and Aberdeenshire	In covered courts. Stalled in winter. Pastures in summer.	Grasses turnips, straw, and cake.	Do.
Jersey	Housed at night and tethered by day.	Grass, turnips, &c.	At 16 months
Ayrshire	(See report.)		

HEREFORD CATTLE.

REPORT OF CONSUL LATHROP, OF BRISTOL.

I have the honor to inclose a report on Hereford cattle in answer to Department circular of the 18th of July, 1883.

This consulate has in its immediate vicinity three breeds of cattle, viz, Devons, a fine tribe of Short-horns, and Herefords.

I have selected the latter breed as the subject of my report, to the exclusion of the other two, for the following reasons: (1) On account of the wide celebrity already enjoyed by these two breeds, making a report unnecessary; and (2) on account of the fact that the Hereford seems to be, of all breeds in the United Kingdom, the one most suited to the needs of the stock of the United States.

While much of what I have written is undoubtedly familiar to our breeders, yet I trust that this report may contribute somewhat towards diffusing widely a knowledge of the great merits of this sterling breed.

Hereford cattle in the herd are a peculiarly impressive sight. Their grand development, their firm agility and light activity, their intelligent faces and placid expression, and possibly more than anything else their wonderful similarity to each other, all combine to make a spectacle pleasing to even the most indifferent observer. He cannot fail to note how closely they conform to a common type, and that type a striking one. Its main feature is suggested when I say that they are oftener spoken of as "white faces," or "red-with-white faces," than as Here-

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tords. But Hereford cattle have not always thus assimilated so closely to a common type. Up to well within the present century there were four distinct varieties of the breed differing widely from one another in appearance, but three have succumbed so completely to the "red-with-white" face that a Hereford not thus marked is as rare as a white crow.

The origin of the breed is doubtful. The best authorities consider it aboriginal; others claim its importation from Normandy or Flanders; others, again, think the climate and conditions of Hereford County have made what they have out of an animal that originally inhabited the shire of Devon. Be its origin what it may, its environment in Hereford County and surrounding counties has resulted in one of the finest beef producing breeds of cattle in the world, nor is the breed to be despised for the dairy under conditions more favorable than are to be obtained in its home county.

The authentic history of the breed begins about the year 1800. In the year before this occurred the first cattle show of the celebrated Smithfield Club, and a Hereford ox was the winner of the first prize; a more general acknowledgment of merit then than now, because at that time, and indeed up to the year 1851, all breeds were shown in competition with each other. This ox was 6 feet 7 inches high, 10 feet 4 inches girth, and weighed 1,976 pounds (live weight). His success was maintained by the breed so well that up to 1851 the Herefords are credited in Smithfield Club records with one hundred and eighty-five prizes for their oxen and steers against one hundred and ninety for all other breeds together, including Shorthorns, Devons, and Scotch. The record of prizes won by Hereford cows and heifers is, however, by no means so good, being twenty-two for them against one hundred and eleven for all other breeds. Mr. Duckham, in his interesting and valuable little work on the breed, comments thus on this disparity between the success of the males and females. He says:

This is certainly a great falling off compared with the oxen and steers, and goes far to prove the correctness of my remark respecting the study of nature's laws in the cultivation of the soil and of the adaptation of stock to it. The soil of the county of Hereford being neither applicable for dairy or feeding purposes, those who have cultivated it for ages made it their study to breed steers and oxen which should, by their superior quality and aptitude to fatten, command the attention of the distant grazier.

Herefordshire has 550,000 acres. About 100,000 acres are not fitted for pasture nor agriculture; the balance is divided equally, almost, between these two pursuits. The substratum is a light-red sandstone, and the soil generally is a deep-red heavy loam, sometimes with some clay in it. The surface of the county is hilly, and averages about 250 feet above sea-level. There are some small but beautiful and fertile valleys. The culture of tree-fruits, notably apples, and of hops is largely pursued. Damp fogs prevail at some seasons and help to keep the grass beautifully green all the year round.

Mr. Southall has kindly furnished me with the following particulars of temperature, rainfall, &c., the results of his own observations at his house in Ross, the southern part of the county:

Temperature.		1852.	1853.
Absolute maximum	84.1	77.0	
Absolute minimum	19.6	118.8	
Average maximum	56.1	56.1	
Average minimum	42.3	42.3	
Mean	49.7	49.7	

* The temperature reached this extremely moderate height only on three or four days in the year. On one day only.

The rainfall amounted in 1883 to 31.52 inches, being 1.34 inches more than the average. There were in this year 197 days on which rain fell. The ideal Hereford is thus described by Mr. Duckham:

The face, throat, chest, lower part of the body and legs, together with the crest or mane, and the tip of the tail, a beautifully clear white; a small red spot on the eye, and a round red spot on the throat, in the middle of the white, are distinctive marks which have many admirers. The horns are of a yellow or white waxy appearance, frequently darker at the ends; those of the bull should spring out straightly from a broad flat forehead, whilst those of the cows have a wave and a slight upward tendency. The countenance is at once pleasant, cheerful, and open, presenting a placid appearance, denoting a good temper and that quietude of disposition which is so essential to the successful grazing of all ruminating animals; yet the eye is full and lively, the head small in comparison to the substance of the body. The muzzle white and moderately fine thin cheek. The chest deep and full, well covered on the outside with mellow flesh; kernel full up from shoulder-point to throat; and so beautifully do the shoulder-blades blend into the body that it is difficult to tell in a well fed animal where they are set on. The chine and loin broad; hips long and moderately broad; legs straight and small. The rump forming a straight line with the back, and at a right angle with the thigh, which should be full of flesh down to the hocks without exuberance; twist good, well filled up with flesh even with the thigh. The ribs should spring well and deep, level with shoulder-point; the flank full, and the whole carcass well and evenly covered with a rich mellow flesh, distinguishable by yielding with a its pleasing elasticity to the touch. The hide thick, yet mellow, and well covered with soft, glossy hair having a tendency to curl.

A glance at the cuts presented here will show us immediately how closely the animals whose portraits have been selected to accompany this article answer to this description. The bull, Romeo, is perfect. He was bred by Mr. Carwardine, of Leominster, in Herefordshire, and was sold in 1882 to Messrs. Earl & Stuart, of Lafayette, Ind., where he now is.

The ox pictured here was bred by Mr. J. Price, of Pembridge in Herefordshire. He won the Elkington Challenge Cup at Birmingham in 1881, and again in 1882. This prize has never before been won twice by the same animal, and, in recognition of his great feat, the portrait of this ox is to have the place of honor, the title-page, of volume 14 of the Hereford Herd-Book, just about to be issued. The general rule is to admit to the herd-book only cuts of such animals as take first prize at a royal agricultural show. The thirteenth volume, I may mention here, contains the names of 199 breeders, of whom 11 are either in the United States or Canada. The fourteenth volume, which is to be issued in February next, contains, I am informed, a much larger number of breeders' names. I hardly think it necessary, but still I venture to suggest that no American owner or breeder of Herefords eligible for entry should omit to register them. The herd-book is under the control of S. W. Urwick, esq., of Leominster, and all breeders of these cattle are under obligation to him for the accuracy and completeness of the work. I take pleasure in acknowledging here the obligation I also am under to Mr. Urwick for assistance rendered and information extended in connection with this report.

The two cows portrayed here are both royal prize winners at late shows. Golden Treasure has a little too much white for a perfect Hereford, but in other respects she is all that a pure-bred Hereford should be.

Herefords were formerly used considerably in the yoke, where "they combined the activity of the Devon with the strength of the Short horn." There, as well as in grazing, their placid, quiet temper rendered them doubly valuable. In these old days when they were put to the yoke, when the demand for meat was not so pressing as now, nor money requiring so rapid a turn-over, they were often kept until six or seven

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years old; and their flesh developed "that beautiful marbled appearance caused by the admixture of fat and lean which is so much prized by epicures." Such finely ripened beef is no longer procurable, as the Hereford is now considered ready for the market at from 20 to 30 months old. Grass with a little oil-cake is all they need, and their agility in grazing and facility for fattening makes the steers much sought after to graze in the midland counties for the London market. They are in their prime at three, but will grow up to four, and their live weight at maturity is from 1,800 to 2,500 pounds. The calves are dropped generally from April to July. Yearling heifers are seldom put to the bull. The calves run on their dams for 6 or 7 months, and are rarely weaned on oil-cake. The young steers are fed upon grass, and get turnips and cut straw and sometimes a little oil-cake in winter.

I subjoin to this report a table showing the live weights of all the cattle of all breeds exhibited at the eighty-sixth annual show of the Smithfield Club in December, 1883, prepared by me from the official catalogue. It is presented more as a matter of interest than for any deductions that might be drawn from it. "The youngest and oldest Hereford classes as a general thing at these shows," Mr. Duckham writes me, "are the heaviest of any exhibited." The superiority in weight of the younger classes proves, of course, their earlier development; the superiority of the oldest, indicates that eventually they attain a greater size than other breeds. But I have already said that Herefords are not commonly allowed, for various reasons, to obtain the age which in the past made them so remarkable for their size and weight.

Another reason for the lack of "tall figures" in these days for cattle weights is the partial abandonment of the time-honored practice of feeding up stock until it becomes so fat as to be literally useless for any other purpose than to take a prize.

Mr. McDonald, in his report to the Royal Agricultural Society upon the stock exhibited at the society's meeting at York in July, 1883, says on this point:

Overfeeding has been disappearing somewhat in recent years. There is still too much of it, however.

He says elsewhere:

Preparation for modern show yards is a severe ordeal and only good constituted animals can endure it. It leads to many breeding mishaps and failures; but when one finds the sires and dams of so many of the prize-winners themselves in prize-lists, as was the case at York, one is forced to the conclusion that successful showing and breeding go hand in hand to a considerable extent and to a larger degree than is commonly imagined; and one is led to believe that high feeding is not so detrimental in skillful hands to successful breeding as is generally imagined.

Herefords, and only Herefords, are found in Herefordshire, Shropshire, Monmouthshire, Radnorshire, Breconshire, and also in Worcestershire and Montgomeryshire. Large numbers are also found in Cornwall and Ireland, and there are herds of them in many other counties. They are seldom crossed with the Short-horn, though they are said to blend well when it is done; the same statement holds good with the Ayrshires. Hereford on Devon has been tried, resulting in a progeny inferior in some respects. Hereford on Alderney is said to produce satisfactory results, improving the cow of the first cross as a feeder and not injuring her milk in quantity or quality. A cross with the West Highland Kyloe was a failure, but with Galloway Polls was a great success. These statements of the results of Hereford crosses are taken from a prize essay for the Royal Agricultural Society made by the late J. H. Dixon, a notable authority on such matters when alive.

Evidence establishes beyond question that the Hereford when removed to almost any climate does not degenerate as a beef producer. The females, too, of the breed are found most satisfactory for the dairy, under different conditions than can be found in their home countries. Both of these conclusions are contrary to an opinion I have heard many express to the effect that Herefords deteriorate away from home. But I have observed that while such an opinion seems very general, it is maintained by those without special knowledge of the breed, and I think it an inherited prejudice which a little investigation would disprove to the satisfaction of the holder. "Old prejudices die hard" is true and trite. In Bedfordshire and Dorset herds have been maintained for many years, fifty in some cases, and these herds are fully up to the standard of the homebred ones; in every case, that is, in which due care has been taken to get an occasional infusion of fresh blood. In the wet and changeable climate of Cornwall the breed is established largely and maintains its reputation, though Devons and Short-horns are said to deteriorate there. In the counties near London, Surrey, Cambridge, and Kent, Herefords have done well; also in Wales and Scotland. They withstand the severe climate of the latter country without seeming difficulty, and will live where many Short-horns cannot. In Ireland they are much esteemed and their number is constantly increasing. They maintain in all these places their characteristics of early development and rapid and even fattening.

The breed seems to stand the heat with the same indifference it does the cold. In Jamaica the progeny of some imported Hereford bulls have proved the most valuable and useful stock in the island; and the heat of Australia has not affected in the slightest degree the characteristics of the large number of Herefords there. Of their success in the United States I shall speak farther on.

I have thus far considered the Herefords mainly as a butcher's breed. I will now speak of their qualifications for the dairy. In the shire of Dorset, one of the crack dairy districts of England producing a butter much sought after,* there are many Hereford dairy herds. The owner of the largest of these herds wrote twenty years since as follows:

Our herd of Herefords have been established nearly thirty years, and so far from their being degenerated with us they are much improved, and Hereford dairies are becoming very common in this county. In proof that they are good for milk with us, we let nearly 100 cows to dairy people, and if I buy one of any other breed to fill up the dairy, they always grumble, and would rather have one of our own bred heifers. Our system is, we let our cows at so much per year, finding them in land and making the hay; the calves being reared by hand with skim milk and luscious until three months old, when we take them, and allow a quarter's rent of the cow for the calf at that age; they are then turned into the pasture.

The proprietor of this herd and writer of this letter was Mr. James, of Blandford, Dorset. His son writes me under date January 19, 1881, that the same system is still pursued and that the Herefords are as great a success as ever. He says:

My late father and myself have kept and bred Herefords for dairy cows for forty eight years and have always used the best blood we could get. I have won a number of prizes for "dairy cows" and "dairy cows and offspring" against Devons and Short-horns.

Mr. James further says:

In a cold, wet, sour place there is nothing like the Herefords: their good coat a protection in the winter. The butter that is made is a splendid color and taste.

So much appreciated is this Dorset butter, that to my personal knowledge it is a common practice for retailers in Bristol to call certain fine grades of *Normandy* butter Dorset butter. They say it is about the same and helps the sale.

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There are lots of Hereford dairies in this county. In the year 1881 I sold two bulls to cross Short-horns, and I know parties who have crossed Herefords with Short-horns and have come back again to the Herefords.

Mr. White writes me from Wiltshire as follows:

I keep a dairy of ninety pure bred Hereford cows, which breed has been kept on this farm for the last sixty years, and I have at all times endeavored to obtain the milkiest strain I could, and I think I have now a herd of cows more adapted to dairy purposes than any other Hereford herd in this country. I have made fair trials between the Hereford and Short-horn as to profit, and I give my decided preference to the former.

The testimony from these two herds is the most valuable that could possibly be obtained as to the dairy capabilities of the breed, as they are the largest, and have been longest established of any in existence. I have received letters similar in tenor to the above from various smaller breeders in different counties, and I have not been able to discover an instance where breeders or dairymen have changed back to other breeds after starting in with Herefords. I had hoped to send with this report some figures giving actual milk and butter products, &c., but I must leave them for a supplementary report, as I have already detained this one over a month, waiting for the promised statistics. But it is not so much as milkers that the United States are interested in the breed, but as beef producers; and that in this capacity they are indeed largely interested will be proved when I say that the extraordinary demand for pedigree Herefords from the United States in the last few years has so increased the price of these cattle that the Hereford breeders are looked upon with envy by other breeders throughout the kingdom as having "struck a bonanza." That Herefords will repay a large expenditure is undeniable. Their tremendous development of flesh, their activity as feeders, their insensibility to changes of climate, their hardiness, their quiet and placid tempers, are just precisely the qualities needed for the improvement of our Western, Texas, and "Spanish" cattle. Their bulls, too, have a marvelous faculty of impressing their qualities on their get, and there is many a half-breed Hereford which is absolutely indistinguishable in appearance and quality from a pure bred one, so completely is the influence of the dam eliminated. Another point. The Hereford is specially strong just where our Western cattle are weak, viz, in the development of the flesh on the back. The back of a well ripened Hereford steer has been compared to a table, and the back of a Texas steer to a wedge. Volumes could not say more.

There were two remarkable sales of Herefords during the past year: one, the dispersal of Mr. Pitt's herd at Chadnor Court, and the other the dispersal of Mr. Turner's herd at Leen. Mr. Pitt established his herd in 1842 from four celebrated cows of the day. I present a little statement of the amounts received by Mr. Pitt at this sale.

Number of animals	Value.	Average
30 cows with two calves		
10 calves	\$13,450 00	\$1320 00
2 two-year-old heifers	4,062 03	108 47
2 three-year-old heifers	1,718 05	651 50
12 yearlings	1,111 07	371 22
2 bulls	91 87	45 93
	2,809 00	400 00

Ninety-one animals averaged about \$375 each.

The average of \$651.50 for twelve two-year-old heifers has never before been equalled in England in any breed.

Mr. Turner's herd has been established for about eighty years, his grandfather being the founder. Since 1854 Mr. Turner has won with individuals of his herd 111 first prizes, 60 second prizes, 11 third, besides 52 special prizes. He received an average of \$369 apiece for his animals, his cows and calves averaging a little higher.

These two herds were exceptionally fine and had a wide celebrity. Many of the animals went to the United States, making, with all others forwarded, a total of 1,800 pedigree Herefords sent to the United States from February 1, 1883, to February 1, 1884. This includes one lot of 300 sent to Baltimore in January of this present year.

The question naturally comes up now, whether this demand for the Herefords is a fancy or a fashion, likely to die out and let down prices. It is worth considering. I have said that the principal demand for the Herefords in the United States was as beef makers, but I did not intend at all to intimate that their merits as milkers were overlooked. On the contrary many breeders in the United States are enthusiastic over them as a dairy breed and quite a number of wealthy men are forming herds. Some go so far as to claim that the Hereford is the coming breed, which is going to carry all before it, and that the Short horn will eventually fall before the Middle horn, just as the Long horn went down in the past. The high esteem in which the breed is held in the United States and the growing appreciation of its merits which exists in England preclude, it seems to me, the possibility of a fall in prices in the near future or in fact for many years. It is even possible that for a time prices may go higher than now. A gentleman writes me from Hereford County thus:

I am now looking out for a lot (of pedigree Hereford cattle for America); they are more difficult to get, as the demand has been great and prices are much higher.

HOW TO EXPORT HEREFORDS.

By far the larger proportion of the Herefords sent to the United States go via Liverpool, though several large herds have been sent by way of Bristol. I am of the opinion that in many cases better facilities could be obtained via Bristol than are obtained via Liverpool. One reason I have for this opinion is the fact that several of the steamers plying in the lines from Bristol to New York are unusually high between decks, and extremely well lighted and ventilated—an important matter. Another advantage is that cattle can be brought from Hereford in the cars directly alongside of the ship's deck.

The Great Western Railway Company quote the following to me as about their average rates for transporting cattle from the town of Hereford to Bristol or to Avonmouth docks (a port of Bristol):

Half wagon-load consisting of 4 cattle.....	\$5 40
Small wagon-load consisting of 7 fat cattle.....	8 20
Medium wagon-load consisting of 8 fat cattle.....	9 20
Large wagon-load, unlimited (holding about 10).....	11 00

The Great Western Steamship Company, plying between Bristol and New York, inform me that their rates average from \$25 to \$30 per full-grown animal. The ship provides water and stalls, and their bills of lading contain this clause: "Ship not accountable for mortality or accident from any cause whatever." A herd of one hundred and nine Hereford cattle was carried on this line some time ago at the following rates: Cows and heifers, \$21.33 each; calves, \$12.16 each; sucking calves, \$4.86 each.

A herd of fine Jersey cattle carried on this line subsequently, when freights were higher, paid an average of \$30.50 each for full-grown animals.

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In order to take proper care of valuable cattle in ocean transit, there should be one man for each twelve cattle. Competent men for this purpose can be hired in England for about \$1.25 per day and all expenses paid, including a pass back to the port of departure. When a steamer gives a rate for carrying cattle, the pass over and back for a certain number of cattle-tenders is included. The foreman in charge of the tenders would of course get more than \$1.25 per day, but in most cases he is the American agent or buyer, or is connected in some permanent capacity with the farm or the business of the purchaser. Such cattle of course are insured to their full value almost invariably, and, admitted, being breeding animals, into the United States free of duty. Certificates from a veterinary surgeon and from the consul at the point of departure invariably accompany such consignments.

HEREFORDS IN THE UNITED STATES.

Any account of Herefords in the United States would be incomplete without mention in connection therewith of the name of Mr. T. L. Miller, of Beecher, Ill. He was the first, or one of the first, to perceive what a boon to the stock of the United States the almost unknown Hereford would be, and for years he has persistently and enthusiastically advocated him in his *Live-Stock Journal*. In 1873 he imported from Hereford a two-year-old heifer, Dolly Varden, with a calf at foot. She has brought a live calf every year since, one of the first being the bull Success, "hitherto acknowledged as the best Hereford bull in the United States, and still alive and active." Dolly Varden and Success have been repeatedly exhibited and never beaten, whilst the get of Success has in several instances brought \$1,000 per head.

The Hereford Times, of October 18, 1883, says:

To this purchase of Dolly Varden and her calf, combined with the indomitable energy and perseverance of Mr. Miller, the brisk demand, present high favor and reputation in which Hereford cattle are held is attributable.

Mr. Miller's neighbors in Illinois are following his example in importing Herefords. Messrs. G. Leigh & Co., of Beecher, Ill., have bought eight animals within the past few weeks from the herd at Felhampton Court; Mr. Culbertson, of Chicago, two; and Mr. J. V. Farwell, also of Chicago, sixteen, all from the same herd.

ACKNOWLEDGMENTS.

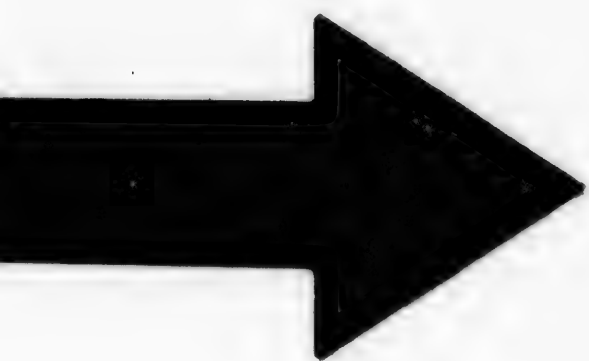
In conclusion, I wish to acknowledge the extreme courtesy with which my requests for information have been responded to by the breeders of Herefords. It is not always easy for a consul to obtain information. His requests sometimes are met with discourtesy, sometimes with indifference; but in this case only five letters out of about a hundred and thirty-five dispatched by me remained unanswered. In every case in which I had a personal interview with Hereford men, except one, every facility was placed at my disposal for a thorough investigation. I have to acknowledge, especially, the kindness, in connection with this report, of Thomas Duckham, esq., M. P.; of S. W. Urwick, esq., secretary of the Hereford herd-book; of J. Bowen Jones, esq., of Shropshire; of Lord Moreton, M. P.; of E. G. Clarke, esq., of Bristol; and of N. J. Hine, esq., assistant secretary of the Smithfield Club.

LORIN ANDREWS LATHROP,

Consul.

UNITED STATES CONSULATE,
Bristol, January, 31, 1884.





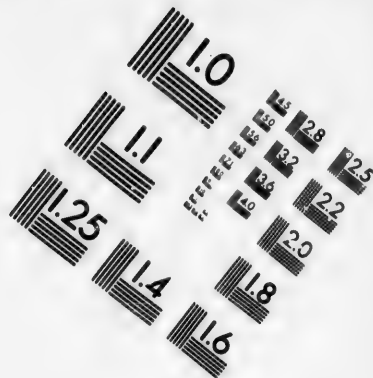
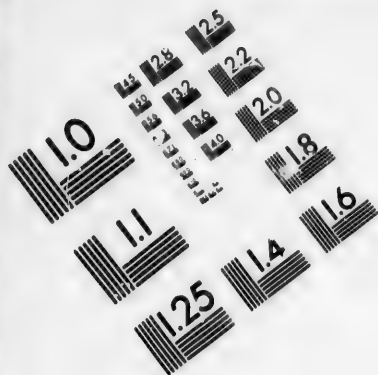
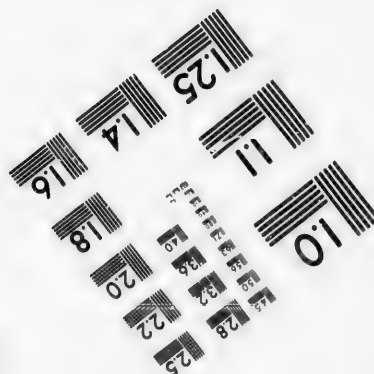
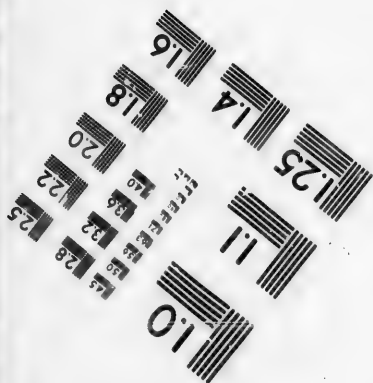
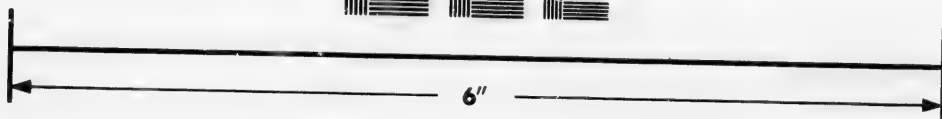
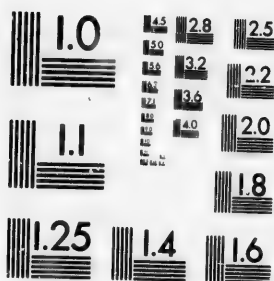


IMAGE EVALUATION TEST TARGET (MT-3)



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A table prepared by Consul Lathrop, of Bristol, showing the respective weights of the cattle exhibited at the eighty-sixth annual show of the Smithfield Club, December, 1883.

STEERS NOT EXCEEDING TWO YEARS OLD.

Herefords.	Short-horns.	Devons.	Sussex.	Red-Polled breed.	Scotch Highland breed.	Scotch Polled breed.	Cross-bred cattle.
Cwt. qr. lbs.	Cwt. qr. lbs.	Cwt. qr. lbs.	Cwt. qr. lbs.	Cwt. qr. lbs.	Cwt. qr. lbs.	Cwt. qr. lbs.	Cwt. qr. lbs.
11 1 10	12 0 20	10 2 10	12 2 24	.....	.....	.....	13 2 24
13 0 12	13 1 14	10 1 14	13 2 25	.....	.....	.....	11 2 14
14 0 20	13 3 4	9 0 10	11 1 8	.....	.....	.....	11 3 22
12 2 24	12 2 23	8 2 0	12 0 2	.....	.....	.....	13 0 0
13 3 18	12 2 26	9 3 23	12 1 8	.....	.....	.....	12 3 27
12 0 20	11 1 10	10 0 20	12 2 25	.....	.....	.....	12 0 21
.....	12 0 25	8 3 20	13 3 0	.....	.....	.....	12 1 20
.....	12 0 0	.....	.....	.....	.....	.....	.....

STEERS ABOVE TWO AND NOT EXCEEDING THREE YEARS OLD.

15 1 4	16 0 16	14 1 4	13 3 20	12 2 0	.....	16 2 28	16 3 5
15 1 6	18 2 5	12 1 22	15 0 4	12 1 24	.....	16 3 8	17 0 21
17 0 24	16 3 10	12 2 2	19 0 5	14 0 18	.....	16 2 20	17 1 4
15 2 21	14 1 21	13 3 6	18 3 24	.....	.....	13 2 20	17 1 4
16 1 4	17 1 0	14 3 10	14 0 20	.....	.....	16 0 8	18 0 22
15 3 12	17 2 20	15 1 9	18 0 0	.....	.....	15 0 15	17 2 6
15 0 24	17 3 8	12 3 0	16 0 2	.....	.....	16 1 4	15 3 26
14 3 22	17 1 4	14 5 12	.....	.....	.....	14 2 10	16 0 24
.....	18 0 10	.....	.....	.....	.....	18 1 10	17 0 16
.....	16 2 20	.....	.....	.....	.....	19 0 20	17 0 16
.....	18 2 4	.....	.....	.....	.....	.....	.....
.....	18 3 8	.....	.....	.....	.....	.....	.....
.....	19 0 27	.....	.....	.....	.....	.....	.....

STEERS ABOVE THREE AND NOT EXCEEDING FOUR YEARS OLD.

17 3 14	19 3 0	17 2 6	20 1 0	15 1 20	15 3 20	18 2 10	19 1 24
18 2 16	19 1 20	17 2 6	18 3 2	17 3 6	15 3 14	17 0 0	19 3 3
.....	18 2 16	15 3 20	.....	.....	.....	21 0 23	20 2 20
.....	.....	14 2 7	.....	.....	.....	19 0 23	.....
.....	.....	14 0 18	.....	.....	.....	17 1 0	.....
.....	.....	17 1 22	.....	.....	.....	.....	.....
.....	.....	13 2 2	.....	.....	.....	.....	.....

HEIFERS NOT EXCEEDING FOUR YEARS OLD.

17 0 18	18 1 5	14 0 1	16 3 14	12 1 24	.....	14 1 10	11 1 6
17 0 26	16 3 12	13 3 12	14 0 8	13 3 22	.....	17 2 22	13 1 5
18 3 27	16 3 20	12 1 20	14 0 18	9 2 18	.....	.....	13 3 16
.....	16 1 10	12 0 0	17 3 10	.....	.....	.....	14 0 18
.....	15 3 18	13 0 2	13 3 2	.....	.....	.....	17 3 20
.....	15 3 20	.....	14 3 26	.....	.....	.....	13 3 10
.....	13 6 14	.....	.....	.....	.....	.....	.....

COWS ABOVE FOUR YEARS OLD.

20 3 2	21 0 0	13 3 6	16 0 16	17 2 24	14 0 5	.....	19 3 0
.....	19 2 12	12 1 13	16 2 6	14 3 4	13 2 10	.....	17 2 20
.....	18 1 8	17 1 4	15 3 10	13 0 14	11 3 12	.....	14 2 24
.....	19 1 18	13 1 10	14 0 21	.....	11 1 0	.....	17 3 15
.....	17 0 8	13 3 15	20 0 5	.....	.....	.....	.....
.....	16 3 14	.....	.....	.....	.....	.....	.....

active weights of the cattle
club, December, 1883.

OLD.

	Scotch Polled breed.	Cross-bred cattle.
1	Cwt. qr. lbs.	Cwt. qr. lbs.
2	13 2 24	11 2 14
3	11 3 22	11 3 22
4	13 0 0	12 3 27
5	12 0 0	12 0 21
6	12 1 20	

YEARS OLD.

1	16 2 26	16 3 5
2	16 3 8	17 0 21
3	16 2 20	17 1 4
4	13 2 20	17 1 4
5	16 0 8	18 0 22
6	15 0 15	17 2 6
7	16 1 4	15 3 38
8	14 2 10	16 0 24
9	18 1 10	17 0 16
10	19 0 20	17 0 16

YEARS OLD.

1	18 2 10	19 1 24
2	17 0 0	19 3 5
3	21 0 23	20 2 20
4	19 0 22	
5	17 1 0	

OLD.

1	14 1 10	11 1 0
2	17 2 22	13 1 5
3		13 3 16
4		14 0 18
5		17 3 29
6		13 3 10

1	19 3 0
2	17 2 20
3	14 2 24
4	17 3 15

HEREFORDSHIRE AND HEREFORD CATTLE.

REPORT PREPARED FOR CONSUL DOCKERY, OF LEEDS, BY MR. JOHN KERSLEY
FOWLER, PREBENDAL FARM, AYLESBURY.

DESCRIPTION OF HEREFORDSHIRE.

In writing an account of this very valuable and beautiful tribe of cattle, it is necessary to give a description of the county which gives its name to the breed, and also of the soil and climate, as well as the general characteristics of the district, as this particular breed of cattle is specially adapted to certain localities in England, and, although I will not venture to affirm that they will not thrive under other climatic and geological circumstances than their own county, from my own personal experience I find that they are more adapted for those districts which partake more or less of the character of Herefordshire.

This county is situated in the west midland district of England, adjoining the Welsh counties, and is bounded on the north by Shropshire, on the east by Worcestershire and Gloucestershire, on the south by Monmouthshire, and on the west by Radnorshire and Breconshire. It will, therefore, be seen that it has no sea coast, but the river Wye running through the county gives it communication with the sea, through the Bristol Channel. It is well supplied with railway communication, the Midland giving it a direct route to the north, and the Great Western to the south and west, and also to the metropolis. The city of Hereford itself is, also, connected with the Northwestern line, via Malvern and Worcester, thus giving the county every means of supplying the various grazing districts of England with numbers of excellent store cattle, as also for the dispatch of fat animals to the markets of the great metropolis and the teeming populations of the many thriving towns in the north.

The soil of the county is varied, the larger portion is a red clay, as also strong loam. Around the town of Ross, where some of the choicest specimens of the breed are found, the soil is a loamy gravel or light loam. The old red sandstone forms also a considerable portion of the county, and some of the hills are limestone. The valleys are particularly adapted for the feeding of cattle, as they are moist and rich, and the soil is of a mixed character, from the continuous washing away of the hills, and the debris finding its way to the lower grounds, and forming a rich alluvial deposit well suited for the production of the finest grasses. The hill-sides and higher portions of the county are eminently suited for the breeding and rearing of cattle, and the comparative mildness of the climate is favorable for the health and early development of the calves.

The acreage of the county is 532,890 acres, divided into or about the following proportions:

Orchards, 27,000; woodlands, 37,000; and the remainder for agricultural operations. According to the last Government returns there were under—

	Acres.
Corn crops.....	95,290
Green crops.....	32,813
Clover and rotation grasses.....	34,108
Permanent pasture.....	265,661
Bare fallow.....	11,247
Hops.....	6,416

* Juror at the Paris Exposition of 1878.

It will therefore be seen that the permanent pasture far exceeds all the other portions of the land put together. The population in 1881 was 118,147. Very few of the people are employed in manufactures, but many find employment in the autumn in hop and fruit gathering.

THE GREAT CATTLE FAIR IN HEREFORD.

The city of Hereford is situated somewhere near the center of the county, and is in latitude $52^{\circ} 4'$ north, and longitude $2^{\circ} 54'$ west. The climate is on the whole temperate. The city is small, and has been the seat of a bishopric from the earliest times, for more than twelve hundred years. The cathedral is very beautiful, but does not rank among the largest of the English fanes. It has portions of Norman work in it, and since its restoration has been made one of the handsomest interiors in the Kingdom. The city proper is rather poor, but some of the streets and the market place are large and spacious, and at fair time their appearance is very wonderful, every portion of the streets, even up to the cathedral yard itself, is crowded with the "white-faced beauties" of the county; while Shropshire, Monmouthshire, Breconshire, and even Gloucestershire send their contingents. It is indeed a remarkable sight, being different to anything of its class in England, as the thousands of cattle brought together are all of one type, deep brownish-reds with white faces, and some other portions of the body and tips of tail white. There is no interspersing of Shorthorns or other breeds, an occasional Devon is seen, but that seems to be an accident, and the shouting of drovers, the bellowing of the cattle, and the general hum of conversation whilst the deals are made, form a singular and very amusing sight. The great fair takes place in the third week in October, and as many as from 8,000 to 9,000 head of cattle have been brought for sale during that time. Some years ago dealers like Carwandine, Pardington, Jones, Knight, and Price were accustomed to bring some hundreds, and generally sold them to the graziers of the midlands or to other dealers who brought them up to the great markets at Banbury, Aylesbury, and Northampton, where there was always a ready sale. The trade now seems quite changed, and but few good animals ever reach the midland markets, as the graziers themselves go down by rail in a few hours and buy largely of the breeders, or dealers, who get together on their own premises lots of from 30 to 100 for their selection, and it is only rarely that men can be suited at the old markets.

HISTORY OF THE HEREFORD BREED.

I am greatly indebted to the writings of the late Mr. Dixon, a well-known agricultural writer, for much of the information contained in this paper, as well as to my good friend Mr. Duckham, member of Parliament for Herefordshire, who was the editor of the *Hereford Herd-Book*, and who has done as much, or perhaps more than any other man, to bring this noble race of cattle prominently before the public at the present time, who has given me much valuable information, and I cannot do wrong in quoting from these most reliable authorities for many statements which I shall make in this paper. I will also give my own personal experience as a grazer, and judge at the royal and other agricultural shows, where I had many opportunities of getting well acquainted with this breed.

Old Fuller, who was a quaint writer of more than two hundred years ago, says of Herefordshire, "that it doth share as deep as any county in

pasture far exceeds all
the population in 1881
engaged in manufactures,
and fruit gathering.

HEREFORD.

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Mr. Dixon, a well-
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two hundred years
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the alphabet of our English commodities, though exceeding in W. for
wood, wheat, wool, and water," and "that its wheat was worthy to jostle
in pureness with that of Heston, in Middlesex, which furnished man-
chets for the kings of England, and its Wye salmon were in season all
the year long." And before his day "painful Master Camden" described
the county as "not willingly content to be accounted secondshire for
matters of fruitfulness." Yet both writers are silent as to cattle, and
Drayton sang of "fair Suffolk's maids and milk," of the hogs of Hamp-
shire, the calves of Essex, and how

Rich Buckingham doth bear
The name of "Bread and Beef;"

yet he says nothing of these attributes of Herefordshire.

Many writers were of opinion that the Herefords were descended from
cattle from Devon and Normandy, which were of a deep reddish brown
color, and that the white faces were an accident from a singular sport
of the breeding of a white-faced bull by a noted breeder of the last cen-
tury, Mr. Tully, of Huntington, near Hereford. The story I have heard
related as follows: That the cow-man came to him, on his coming out
of church one Sunday, and told him that his favorite cow, who was
daily expecting to calve, had produced a bull-calf with a white face, and
this had never been known before. Report says the master ordered it
at once to be killed, as he dared not let it be known that he had such a
stain of blood in his well-known herd; but the man begged him to go
and see it, as it was the finest calf he had ever seen. Mr. Tully, when
he had seen it, agreed with his man that it was a wonder, and that he
would, out of curiosity, rear it. He did so, and he proved to be a very
remarkably fine animal, and he used him on all his best cows, and his
progeny became celebrated for their white faces. Many old chroniclers
say that the county was noted for its breed of white cattle on the banks
of the Wye as far back as the tenth century, but they had red ears,
and it is recorded that Lord Sendmore in, or about the year 1660, in-
troduced some red cows, with white faces, from Flanders, and this may
have been the reason that the noted Tully bull, after a lapse of more
than a hundred years, might have cropped up, as a sport, from the well-
known deep red cattle of the country. It must not be considered that
the white face is the only type of the purity of this breed, as the mot-
tled face is considered by many breeders as of greater value than the
pure white, and I can myself testify that some of the finest cattle I ever
grazed, and some of the best I ever saw, have been mottled-faced and
light-brindled; in fact those of the last-named type have shown the
greatest aptitude to fatten, on the grass, of any, and many graziers have
told me the same.

Mr. Eyton, of Eyton Hall, Salop, was the founder of the Hereford
Herd-Book in 1845, and when he commenced it, he found it necessary
to divide the Herefords into four distinct classes, viz, the mottled-faced,
the dark-gray, the light-gray or white, and the red with whiteface. Yet,
after the lapse of only thirty-eight years, people question the purity of
the breed, if they have not the characteristics of the well-known white
face and markings.

Mr. Duckham says, "the present uniformity of the color is due to the
influence of the bull," and this is a remarkable corroboration of my
views, expressed in a paper on "Breeding, facts and principles," which
I read at a meeting of the Central Farmers' Club, some few years since,

when I propounded the dictum (which, by the bye, was not new), "that the male exercised the external characteristics, and the internal organization followed the female," in nearly every class of animal. Long before the commencement of the herd-book the Herefords had made "a reputation and a name," by being continually successful at the Smithfield Club annual fat cattle show, from its establishment, in 1799, by Mr. Westcar, of Creslow, near Aylesbury, Bucks, and who, for twenty years in succession, won the premium prize with a Hereford ox, against all kinds of cattle. I had not an opportunity of knowing Mr. Westcar, as he died before my day, but I had been for many years on intimate terms with his relative and successor, Mr. R. Rowland, who gave me many interesting stories of Mr. Westcar, and who was, undoubtedly, the first man to bring the Herefords to the front, against all the world. I remember Mr. Rowland telling me, whilst standing in the midst of the far-famed Creslow Great Ground, and on the spot, marked by a clump of trees, where Mr. Westcar's lifeless body was found, he having fallen dead from his horse, how the Duke of Bedford, in the latter part of the last century, went down with Mr. Westcar to Hereford in his carriage and four post-horses, taking two days for the journey, and stopping one night on the road at the well-known country inn, the Staple Hall, at Witney, and accompanied by Lord Berners, in another carriage and four, with some ladies and other members of their families, to attend the great fair at Hereford, and where the duke desired Mr. Westcar to order dinner for a hundred persons at the principal hotel, and to invite all the more celebrated breeders and dealers to meet him. He described the annoyance of some of the dealers at the noblemen being brought down to see these grand bullocks, which they had only seen in the Creslow pastures, as it had had the effect of raising the price of the cattle in the fair at least £1 per head. After dinner his grace and Lord Berners announced their desire to have from ten to twenty of the best cows that could be found and two bulls, to bring into Bedfordshire, there to establish a herd on their estates. Lord Berners, who was a breeder of Longhorns, gave up the breed and took to Herefords. This visit of the Duke of Bedford, with the continued success of the breed in the show yard, at Smithfield, by Mr. Westcar, brought them prominently into notice, and firmly established their merits. Sir Brandreth Gibbs, the honorary secretary of the Smithfield Club, in his history of the club, states that at their first show Mr. Westcar's ox measured 8 feet 11 inches long, 6 feet 7 inches high, 10 feet 4 inches girth, and that he was sold for 100 guineas. This animal was bred by Mr. Tully, of Huntington, and weighed 247 stone, dead weight, 8 pounds to the stone. Enormous as the dimensions of this ox were, they were far exceeded by another Hereford, fed by Mr. Grace, of Putlowes, near Aylesbury, which was 7 feet high, 12 feet 4 inches girth, and weighed 260 stones, of 8 pounds, dead weight. Mr. Duckham mentions that about the years 1812 or 1813 Mr. Potter sold for Mr. Westcar at the Metropolitan Christmas market fifty Hereford oxen that averaged 50 guineas each, making 2,500 guineas; and he mentions that Mr. Smythies, of Marlow, Salop, obtained the following extract from Mr. Westcar's book for the sale of twenty Hereford oxen at different periods from 1799 to 1811, and which I can corroborate, as the same was shown me by Mr. Rowland, when visiting him at Creslow. The list was confined to those which sold for £100 and upwards;

Date.	Oxen sold.	Value.
Dec. 16, 1799	2 oxen to Mr. Chapman.....	
Dec. 4, 1800	1 ox to Mr. Chapman.....	
Dec. 13, 1800	1 ox to Mr. Harrington.....	£200
Nov. 29, 1801	6 oxen to Messrs. Giblett & Co.....	147
Nov. 7, 1802	1 ox.....	100
Nov. 31, 1802	1 ox to Mr. Chapman.....	630
Dec. 4, 1802	2 oxen to Mr. Horwood.....	100
Dec. —, 1803	1 ox to Mr. Chapman.....	126
Dec. 10, 1803	1 ox to Mr. Reynolds.....	200
Dec. 10, 1803	1 ox to Mr. Giblett.....	100
Dec. 5, 1804	do.....	105
Dec. 4, 1805	do.....	105
Nov. 26, 1811	1 ox to Mr. Chandler.....	105

The whole 20 sold for £2,123, or an average of £106 6s. each.

I have also seen at Mr. Ledbrook's, who succeeded Mr. Grace at Putlowes a few years since, when the price of meat was lower than in the beginning of the century, 50 oxen tied up for Christmas at the end of November, for which he had been bid £2,500; the price was rather under 5s. per stone, but this would have made them average over 200 stone per head. The class of animal I have been describing is now no more. They were five-year old worked beasts, and even older, which had been for two or three years harnessed to the yoke, and had therefore attained great size. Working in the plow is now comparatively rare, and early maturity is the aim of all the best farmers in England, and the Hereford breeders are not likely to be left behind. It is a rare thing nowadays to purchase a Hereford steer at a fair over three years old. When I began farming, thirty years ago, I bought a lot of beautiful three-year-old Hereford steers in October at £13 10s. each, in poor condition. I gave them the run of the straw yard, and 3 pounds of oil-cake per day, and turned them out to grass in May, and sold them in August and September at from £23 to £24 each, giving me some excellent manure and a good profit on the animals. The price of this class of beast rapidly rose, and now they can scarcely be bought under £21 to £22 each, and as they only make about £26 or £27 each when off the grass, they do not pay enough. I once went to a Hereford fair at Easter and bought 10 of the finest old worked beasts I ever saw at £29 10s. each. They were large, de Rothschild saw them and begged I would let him have them, and I consented on condition that he gave me a round of one of them for my Christmas dinner the same year. He took them to Mentmore, and some made £46 to £47 each at Christmas, and others went off the grass in October at £38 to £40 each, but such aged beasts are not found now. Amongst the most noted graziers of these cattle was the late Mr. Senior, of Broughton pastures, near Aylesbury. This gentleman was a very successful exhibitor of Herefords after Mr. Westcar's death, but of late years he grazed Sussex beasts, as he could not get the worked animals from Herefordshire. Mr. Duckham and other writers on Herefordshire cattle say that the county is not by any means a good grazing district, but eminently adapted for breeding and rearing cattle, and that no class of animal thrives so well, when changed on to the fine pastures of Buckinghamshire, Leicestershire, and Northamptonshire.

As Mr. Westcar's name and his residence at Creslow has been so often quoted by all writers upon the Herefords, I must be pardoned for giving a slight sketch of this famous grazing district. "The great ground," as it is called at Creslow, is, as before stated, about 330 acres and is very undulating, and bounded on two sides by a brook, a tribu-

tary of the Thames, and on the other two sides by a large double ox-fence, with large elm trees affording shade to the numerous head of cattle grazing there. I have seen nearly 250 head of horned stock and 500 sheep and lambs, with 20 mares and foals, grazing in this one field, and all getting fat. It is jocosely said that the cattle are turned into the field in May and by the time they have walked around the inclosure they come out fit for the butcher. The old mansion had formerly been a monastery, and the estate belongs to the Lord de Clifford, in whose family it has been for some centuries, and it is stated that Rosamond de Clifford, "Fair Rosamond," was born there. Nothing can exceed the rich pastoral beauty of this district. From the upper ground the eye wanders over the far-famed vale of Aylesbury, the old town, the "Ægelsbireg" of the Saxons, standing in the midst the rich pastures of Whitechurch; Quarrendon, with its ruined chapel of the fifteenth century; and Fleet Marston, in which parish is Putlowes, formerly mentioned as the rival of Creslow as a feeding pasture, and a rare tract of grass land stretching away for more than 15 miles along the valley of the Thames.

Sir Brandreth Gibbs, in his "History of the Smithfield Club," mentions an incident of some interest in 1825. There was a sweepstakes between three Herefords belonging to the Duke of Bedford and three Durhams belonging to the right honorable Charles Arbuthnot, which was won by the Herefords.

Mr. Duckham says that from the establishment of the Smithfield Club in 1799 to 1851 all the different breeds and cross-breeds were shown together, but since that time they have been exhibited in distinct classes. And, as far as can be learned, during the time they were shown together the Hereford oxen and steers won 185 prizes; the Shorthorns, 82; the Devons, 44; the Scotch, 43; the Sussex, 9; the Longhorns, 4, and the cross-breeds, 8; thus showing that the whole of the prizes won by all the other breeds and crosses in the Kingdom were 190, or only 5 in excess of the number registered by the Herefords alone.

Mr. Discan says that during fifty-three years to 1851 the Shorthorns by their females made up considerably to the total of the Herefords, as they numbered 174 prizes to the Herefords 207.

It is interesting to know how the Herefords have retained their former renown, by their comparatively youthful prowess at the present day. We find that Mr. Heath showed his gray beast at Birmingham, winning first honors, with a girth of 9 feet 7 inches; and his Hereford cow at three years and ten months measured 9 feet in girth. Mr. Shirley's gold-medal steer at two years and seven months girthed 8 feet 7 inches. And he averred that up to seventeen months old he had had only an ordinary calf and stock treatment. It will therefore be seen that the breed is not only not deteriorating but is likely to maintain its position against all competitors.

THE HEREFORDS AS DAIRY CATTLE.

Having said so much of the feeding qualities of these animals, I must now allude to their milking properties. Generally they are not considered such good "fill-pails" as their rivals the Shorthorns or Ayrshires, nor such butter producers as the Channel Islands breeds, yet their butter-making qualities are of a high order. I quote from Mr. Duckham, who says Mr. Read, of Elkstone, finds the Herefords retain their general aptitude to fatten, and that in the team they are excellent and

that they have been used for dairy purposes for nearly fifty years on the farm, and that he raises his calves by hand after a few days old.

Mr. James Mappowder, of Blandford, Dorset, says that Hereford dairies are becoming very common in that county; that they let nearly one hundred cows to dairy people, and that if he buys one of any other breed to fill up the number they always grumble. His system is to let the cows at so much per year, finding them in land and making the hay; the calves being reared by hand with skim milk and linseed until three months old, and they are then turned out to pasture.

Mr. Olver, of Penhallow, Cornwall, says:

I rear my calves on skim milk. It is generally said Hereford cows are bad milkers. That is contrary to my experience. My cow Patience, bred by Mr. Cooke, of Moreton House, had given 14 pounds of butter in a week, and Blossom, bred by Mr. Longpiere, Buckton, Salop, gave 22 quarts of milk, yielding 24 pounds of butter per day.

From Ireland and Scotland reports show that excellent results have been attained. It is fair to say that my own experience is contrary to the opinion that they are better for the dairy than Shorthorns, as when I was judge of cattle at Hereford, some few years since, there was a milking competition, and we had all the competitors in the class very carefully milked, and both the first prizes were obtained by Short-horns of high class pedigree, beating all competitors, even including Ayrshires and Jerseys.

THE HEREFORD IN FOREIGN COUNTRIES.

The Herefords have proved themselves well adapted for foreign and colonial countries. Mr. Stone, of Guelph, Ontario, says:

I am an extensive breeder of Shorthorns, which breed I think very highly of; but I have also purchased some Herefords from Lord Bateman's and Lord Berwick's herds, and am highly pleased with them. The climate is very variable, varying in twenty-four hours from 30 to 40 degrees, and that the Herefords stand the changes equal to any breed.

Mr. Edwards, Knockalva, Jamaica, says that for many years they had no change of blood till 1858, when Sir Oliver (1732) and Maleoln (1646) were imported, and that they did the greatest service in the island; that this breed are good workers, hardy, and of great aptitude to fatten. Mr. Merryman, of Maryland, and Mr. John Johnston, of New York, testified to the breed standing the variations of the climate remarkably well. Mr. W. Dangau, from Hunter's River, Australia, in addition to their feeding powers and hardness of constitution, found they were excellent in traveling long distances and that they would do from 250 to 300 miles better than any others. I have, therefore, shown that the Herefords are admirable for foreign countries. Amongst the most noted strains of blood I find from Leopold (1) and Wellington, which bull was sold in 1816 for £283, that the mottled faces are mostly descended, and Victory, which was a dark gray, and Cotmore (376), which was a white-faced bull, and Brockwood, which was a light gray, were all specially noticed in the first number of Mr. Eyton's herd-book.

Mr. Dixon remarks that there were not many points of difference between the dark grays and the mottle faces, the latter of which were known as Ben Tomkins sort, and the Rev. Mr. Smythies, of The Lynch, was one of the best and most spirited breeders of his day, and offered to show a hundred Herefords against the same number of Shorthorns from any herd in England. All these remarks show that much pains and infinite care have been taken in perfecting this noble breed, and for the best lines of blood the herd-book must be consulted.

The breeders put their heifers to the bull at from eighteen months old to two years, and the calves generally run by the side of their dams for several months. The cows are put to the bull at a certain time, so that they may generally come due to calve in the early spring, and to meet the grass; although some others like the cows to calve about October and November, housing the calves, and keeping them on with a little milk and cake, so as to be strong by the summer. Some breeders think that by letting the calves suck the mothers it prevents their coming into season for the bull as early as if they were weaned at once, but from inquiries I have made I find but little difference in it. This is contrary to my own and some other breeders' practice, as I have found the cow lies barren, especially Shorthorns, for some months after calving if the calf lies night and day with the dam. Several Herefordshire breeders are in the habit of giving their calves, at a very early age, good old beans, which should be given whole, and in a few days they begin to crack them after rolling them about in their mouths, and secreting that frothy saliva which seems to be so conducive to a calf's well doing. I have tried the plan and can speak highly of the practice, no food can be better, as beans are peculiarly fitted for forming bone and muscle.

On the whole, I believe the Hereford breed, as a flesh-forming animal, is second to no breed in the world. The meat itself is equal, when well fed, to the best Scotch or Devon, and every authority proves they do well when imported into other climates. In England it is found that the best grass lands are most calculated for their flesh development, and when tied up, liberally fed, and well cared for, they can hold their own in the show yard against any breed in the country. As dairy cattle the Short-horns beat them, but, taking all things into consideration, England may well be proud of her white-faced Herefords.

JOHN KERSLEY FOWLER.

PREBENDAL FARM, NEAR AYLESBURY,

January 7, 1884.

COMPARATIVE MERITS OF BRITISH CATTLE.

REPORT PREPARED FOR CONSUL DOCKERY, OF LEEDS, BY MR. JOSEPH LAY FAULKNER, VETERINARY SURGEON, SOUTH MILFORD.

SHORTHORNS.

In submitting a report of the merits and propensities of our various British breeds of cattle, I will commence my remarks by giving a brief sketch of the modern history of the Shorthorn, or Durham cattle—so termed from the parent stock inhabiting the county of Durham—which have special claims upon the attention of both home and foreign breeders inasmuch as it has the power of more easily adapting itself to all soils, climates, and circumstances than any other animal of the bovine breed, and contributes a greater weight of prime beef, butter, and cheese to our markets, directly and by their influential crosses, than half a dozen of the other established breeds put together. The combination of their milking and feeding properties fully entitles them to the premiership of the general purpose cattle. If we take London and other great dairies as a criterion of the milking qualities, we have abundant proofs of their

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One of our earliest improvers of the Tees water Shorthorns was Charles Collings, who with his brother became a considerable farmer about 1770, but Charles has the credit as an early founder of this breed.

In the year 1810 his herd was sold by auction with the following result:

	£	s.
17 cows.....	2,802	9
11 bulls.....	3,361	9
7 bull calves under twelve months.....	607	15
7 heifer calves.....	942	18
Total.....	6,804	11

Since then a descendant of a calf sold at this sale (Young Duchess) has realized more money than the whole herd was sold for. One, two, and three thousand guineas were frequently paid for members of that tribe or family, of which there is a goodly number in England at the present time and which are still held in high estimation.

The influence of a good sire is shown by the following statement: A remarkable animal termed the Durham ox was got by one of the bulls sold at the above sale out of a common cow. The ox was sold for public exhibition, from which circumstance their sprung up a great desire to possess and improve the Shorthorns in distant quarters. The ox, after being exhibited for several years, was slaughtered after two months illness, which reduced its flesh considerably, but its dead weight of meat, without tallow or offal, was 2,322 pounds. Many other instances of great weight can be recorded, viz:

Live weight of steers under four years old.....	Pounds.
Live weight of heifers under four years old.....	2,212
Live weight of cows.....	2,049
Average dead weight:	2,352
Of matured ox when fed in the ordinary way for market.....	920
Of heifer when fed in the ordinary way for market.....	800
Of cow when fed in the ordinary way for market.....	880
Milk:	
Annual average weight.....	8,000
Weight to 1 pound of butter.....	24
Weight to 1 pound of cheese.....	10

Soil.—Alluvial and light loam in East Riding; in West Riding, brown clay.

Climate.—Mean temperature, 49°. 4.

Color.—Red, white, and roan.

HEREFORDS.

Herefords are an old established breed of high renown, whose fame has gone to the antipodes as possessing many highly meritorious properties, the principal of which is its fattening propensities and high quality of beef. A hardy, strong constitution seems to pervade the whole family, as no signs of delicacy or degeneracy ever appear in their ranks. These characteristics commend them to the notice of home graziers and breeders abroad. For several years past there has been a rush to secure the best specimens on offer for export, and some hundreds of fine animals have recently been consigned to enterprising breeders across the Atlantic. The chief merit of the Hereford is their beef productions; they have little pretension to the supply of the dairy. The calves, as a rule, run with their mothers, whose parental duties in many cases are heavily taxed, but this defect is occupying the attention of many breeders, and it can be removed in time by careful selections and proper observance in mating them. They inhabit large tracts of land partially surrounded by the Welsh hills—land which is well calculated to develop its true character to full perfection. The breed has long been ascribed the best in the west of England. The uniform character has become a

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stamped standard and is universally acknowledged, and is found to answer admirably in Australia, New Zealand, Canada, and the United States. They are very quiet and contented animals, and stand a long sea voyage well, without falling off in condition. Death or difficulty rarely occurs in transit. The origin of the Hereford was from the cattle of the county, from which selections were made, and the breed as it now stands owes all its reputation to modern changes. In the latter part of last century a Mr. Tompkins started a system of breeding which ultimately exercised great influence on the stock of this part of England. Size, adaptation to the dairy, and the purposes of labor were the chief properties studied by the breeders. Two cows fell into the hands of Mr. Tompkins which had an extraordinary aptitude to become fat, on which account he retained them for breeding. One of them, with more white on, he named Pigeon, and the other, a rich red with spotted face, he called Mottle. Mr. Tompkins established his Herefords from the existing breed of the county, and not by mixture with dissimilar kinds from other quarters, and although the improvement commenced in the last century, the Hereford breed was late in being prominently brought before the public as one possessed of the valuable properties for which it is now so justly esteemed.

	Pounds.
Live weight of four-year-old ox at Smithfield show, December, 1883 (offal, 8 pounds to the score).....	2,486
Live weight of four-year-old heifer at Smithfield show, December, 1883 (offal, 8 pounds to the score).....	2,127
Live weight of four-year-old cow at Smithfield show, December 1883 (offal, 8 pounds to the score).....	2,329
Milk, annual average.....	3,000

Soil.—Deep-red loam and clay, lighter and poorer near the Welsh hills.
Climate.—Mean temperature, 49° 7.

Color.—Red, with white face and white streak down back, and a broader one on the belly.
An old established breed, without foreign admixture.

DEVONS.

The Devon is an old and well-defined breed, and is honored with standing first in the catalogue at the Christmas fat-cattle show in London, where it has been known to obtain the highest honors. They are to be found in the greatest purity and perfection in the northern part of their county and a portion of Somersetshire. They are very compact and graceful in appearance and light of bone. Their uniform, deep-red color, peculiar to the North Devon, goes to prove their freedom from any admixture or foreign element, which gives them a high standard of purity.

The purest bred ones are somewhat wanting in size for general purposes, and their improvement is slightly impeded by show-yard decisions, which are invariably in favor of small, compact animals, which no doubt are admirably adapted for their own locality, where they graze well and produce an excellent quality of beef, but they cannot surpass (as many of their ardent admirers try to maintain) some animals of greater weight in arriving at maturity at an earlier age. Therefore they are not eagerly sought after for rich feeding districts in other quarters. There are cases in which great weights have been attained by single animals, but this is not a characteristic of the breed, and will be alluded to hereafter. The stronghold of the pure North Devons is not the richest parts of Devonshire and Somersetshire. The soil is light and varied, in some parts hilly and uneven.

In the richer alluvial plains and near the coast a heavier and coarser class of Devons are kept, for which no special attention is paid to pedigree or refinement. Some splendid steers of this (as well as the North Devon) class reach the London market, where they soon change hands at remunerative prices.

North Devon is a breeding and grazing district, calves are mostly reared with the cows, and often a greater number of calves are seen in the field than cows. The yearling heifers run out through the winter, only receiving a little assistance during a storm. The yearling steers being on their way to the butcher, are kept in yards and receive a moderate allowance of straw and turnips during the winter months, and have liberal treatment until ready for the butcher at three and four years old.

The quantity and quality of Mr. Skinner's cow Myrtle, during the trials at the London show, was a great surprise to all who were not thoroughly acquainted the full capacity of the Devons. The cow was milked at 8.30 a. m., and again at 7.30 p. m., when the result was 26 pounds of milk which gave 14.75 percentage, 5.28 of fat; total award, 87.80. Age of cow, four and one-half years. She calved on July 4, and was tested on October 3, 1883. The solids, which are in excess of the Jersey, is a great achievement, and an event worthy of notice in agriculture, together with the extraordinary weights attained by some highly forced animals. This cow Myrtle gave 50 pounds of milk per day for a considerable period after calving (second calf), and milked for over a year at her first calf. The journey to London and other exciting causes, which are unavoidable in a show-yard career, would to some extent tend to reduce the quantity of milk.

The largest Devons and many of the best milkers are seldom seen in the show yard, as prizes, as before stated, generally go to the most symmetrical. The late Mr. Skinner, father of the present Mr. Skinner, exhibitor of the cow Myrtle, showed some Devon oxen in 1853 (winning at Bridgewater and Taunton Christmas meetings) scaling 1,600 pounds dead weight. This weight is enormous. These animals had, no doubt, been employed in farm labor for some years, and then forced for show. Mr. Skinner has recently sold a bullock under three years old, weighing (dead weight) half a ton. The top average weight for well fed steers three to four years old, is 720 pounds, dead weight; some reach 1,000 pounds with extra attention; but 720 pounds may safely be taken as a fair average for fully-matured Devon steers, although 800 pounds is not unfrequently reached by choice beasts. Cows, when fat, will average 800 pounds at six to seven years. Bulls often weigh, when very fat, a ton (live weight). A selected dairy of cows will average from 500 to 600 gallons of milk a year, many giving up to 700 gallons, and 300 pounds of butter. These are exceptional cases. A prevailing custom in Devonshire is to let cows to dairymen for the season, £13 each being about the average paid.

	Pounds.
Live weight:	
Four-year old ox, at Smithfield show December, 1853 (offal, 8 pounds to the score)	1,966
Weight of heifer, at Smithfield show, December, 1883	1,600
Weight of cow	1,934
Milk:	
Annual average	3,500
To pound of butter	22
To pound of cheese	9

Climate.—Mean temperature, 50°.

Color.—All red. All old breeds established by selections from existing breed of the country.

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THE UNITED KINGDOM.

POLLED ABERDEEN AND ANGUS BREED.

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This breed has long ranked amongst the most valuable converters of vegetable into animal food, and few can excel them for the return when pitted against other breeds, acre for acre. The other Scotch breeds are on a par as to age at maturity, but the Aberdeen may have a little advantage in weight. For long ancestral purity of blood (if it be of importance) it must yield that honor to the Galloway and West Highlander. In some cases they have equaled the ponderous Short-horn in weight. They do not possess the regular uniformity of type and character of the Galloway, but no good end can be served for practical purposes by describing the origin of the breeds. Authorities agree that our existing Pollies are descended from horned cattle, and when the departure from the ancient order of things took place can only be conjectured. These Polled varieties are grouped in three defined breeds, viz, Norfolk, Galloway, and Aberdeen. The latter formerly embraced a variety of colors, but since the systematic improvement has set in, all shades of color, except black, are at a discount, and it is now black and nothing else. They are now being modeled to the breeder's fancy and requirements. The setting on of the tail is a characteristic in the oldest; the removal of this defect will be a valuable achievement when accomplished. The superiority of the Pollies and Highlanders over most other breeds consists in the excellent quality of their beef and the high percentage of dead to live weight. As a rule the meat is well marbled, often a greater proportion of compact, finely-grained flesh, with less coarse fat than many other breeds. Some people will place the Devons before them. I consider it in no way inferior. Both these breeds with skillful care have greater things to look forward to.

Amongst those who are not thoroughly conversant with the Aberdeens an idea exists that they are slow feeders as well as being slow at arriving at maturity. There is little doubt that such was the case. Now, however, it has been so greatly improved in that respect that it matures almost as soon as some of the leading breeds, and if well fed from birth the best specimens become ripe at the age of from twenty-eight to thirty months. This breed is remarkable for retaining loveliness of form during the fattening process, and in cases of excessive feeding they rarely become patchy or disproportioned. Since the rage for young beef became so strong, many have been fed for the butchers at thirty months old, where they have realized from £25 to £35. Many fully-matured bullocks will fetch at the London Christmas market £40 to £48 each. The breed cannot now be distinguished for its milking properties; formerly it was held in high estimation for dairy purposes. The main aim of the improvers has been the development of its beef-producing qualities to the detriment of the flow of milk; and now they are actually deficient in this respect, but with a little attention their ancient reputation can be restored. A few families are excellent milkers; these are becoming more highly esteemed than they were a few years ago. This breed, as well as the Galloway, are finding favor with English breeders, and many herds are already formed in England, also in Ireland. In Scotland itself this breed is extending its territory. More than a hundred herds are now established there. Of the Polled Herd-Book, published in 1862, six volumes have been issued, and in the last the names of 119 breeders appear. There have now been registered 1,930 bulls, 5,054 cows and heifers. The herd-book is now conducted by a society formed in 1869, on similar principles to the Shorthorn Herd-Book. One of our great improvers of the breed was Mr. Hugh Watson, followed by Mr. McCombie,

Tillifour, whose remarkable show-yard achievements, both in fat and breeding stock, have been instrumental in bringing their true merits before the public. The deservedly high reputation the Aberdeens have gained is mainly due to the indefatigable exertions in the promotion of the breed by that popular breeder, whose judgment is entitled to the highest respect. In Mr. McCombie's early days he laid a firm foundation, to which the most noted animals of the present day are closely allied. He purchased the mother of the Prides for the sum of £12 10s. in 1844, and at the dispersion of his herd, in 1880 10 Prides averaged each over £80 10s. One Pride, the fifth in descent from the £12 10s. animal, realized the handsome sum of £283 10s. At the present day they are most valuable and popular; their only real rivals are the Ericas, of Ballindalloch. McCombie's show-yard honors are unparalleled in farm-stock history. I firmly believe there is sufficient scope for judicious selections to be made from the Galloway ranks to obtain as great results as those achieved by those popular improvers of the Aberdeens. The Galloways are by no means pushed to the extent of substance and refinement to which they are capable of developing. Mr. McCombie's success in building the family of the Prides was in a very great measure due to his great judgment and care in the selection of bulls. The difference between the two breeds is, as might be expected, from different circumstances. The Galloway has a thicker skin, a stronger and better coat of hair, and more shaggy appearance than the Aberdeen. Admirers of each breed claim superiority, and on this point considerable difference of opinion exists.

The Aberdeen answers admirably to the indulgence it receives, and the Galloways do well on more humble fare; meritorious animals of both breeds have appeared in the show ring, and, from a butcher's point of view, neither breed has to yield to any other.

Live weight:		Pounds.
Four-year-old ox, at Smithfield show, December, 1883 (offal 8, pounds to the score)		2,375
Cow or heifer (offal, 8 pounds to the score)		1,883
Dead weight:		
Fully matured ox (average) ordinarily fed for market		720
Milk:		
Annual average		3,500
To pound of butter		24
To pound of cheese		10

Soil.—Clay, loam, and peat.

Climate.—Mean temperature, 47° 8'.

Color.—All black.

GALLOWAYS.

Galloways are by nature good milkers, but since the rage for young Scotch beef has sprung up in the London markets, the dairy properties have become a secondary consideration, and the pole-axe has taken precedence of the dairy. As beef producers they rank among the first quotation. At the international show held at Poissy in 1875, the Scotch Pollies were awarded the highest honor for the best live beef against all breeds, which honors were substantiated when dressed. This breed has been distinguished for hardiness and feeding properties for many generations. Their fine qualities are no longer hid under a bushel. Their reputation has spread far and wide, and a great and increasing demand has sprung up, both for home market and export. Being hornless and very docile they are admirably adapted for yard feeding, railway and ship transit.

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They are reared upon thin, rocky, inferior land, in a most severe climate, especially in winter and spring, and their ready response to liberal treatment commends them to all who are engaged in agricultural pursuits. Notwithstanding their climate, the ordinary breeder affords no shelter beyond about three of the severe months, but nature has provided them with a thick, black waterproof of long, thick-set, silky hair, and strong mellow hides to protect the model carcass, and to fit them for the hardships they may have to endure in their native homes, while their more favored rivals, the Aberdeens, are often only exposed for a corresponding period in the summer. This practice has been established many years and is found to succeed well in Aberdeenshire, and all additional winter food consists chiefly of straw and turnips on farms where they can be profitably produced.

It is fully believed that the Galloway can gain a year in maturity, give a third more milk, and a proportionate increase in beef under more favorable circumstances. The price at which selected animals can be purchased: Heifers, at two and three years old, from £25 to £35. Much larger prices are realized in many cases where fashion overrules judgment. By careful cultivation the general milking properties can be restored, and I have the authority of the principal of a large butter factory to state that the Galloway produces the richest milk of any other breed that contributes to the dairy, and is very regular in quantity which supports the remark that their robust constitution defies all ordinary disease; therefore few drawbacks are experienced.

The beef is spoken of in the sixteenth century as being right delicious and tender, which properties it retains in a high degree to the present day. The English graziers found out their good feeding properties soon after the union of the two crowns, and for upwards of one hundred and fifty years the trade has been extensive and is now brisker than ever. The once-prevailing practice of spaying the heifers has been discontinued, and the heifers are now retained for breeding purposes to meet the growing demand, and give a more favorable opportunity of improving the breed by selection.

The Galloway cattle possess all the character and resemblance which constitutes a breed, yet they vary much in size and form according to the treatment they receive and the fertility of their ranges. Not sup- plying young growing stock with sufficient nutritious food, when bone and muscle are forming, is an erroneous practice, which many breeders have followed, when at the same time convinced of their error. These animals answer admirably to liberal treatment, and therefore must be adapted for countries where food is plentiful. I have always received highly satisfactory accounts of the progress made by them in foreign countries.

At the Smithfield show (London), the Scotch Pollies are all classed together as one breed. The weights under the head of Aberdeens is a little more than the Galloway.

Average dead weight of a matured ox ordinarily fed for market.	Pounds.
Milk:	700
Annual average weight.....	3,000
To 1 pound of butter.....	22
To 1 pound of cheese.....	9
Soil.—Loam, clay and sandy.	
Climate.—Mean temperature 49° 2.	
Color.—All black. One of the oldest British breeds.	

NORFOLK POLLS.

They are red in color and have figured at the Royal Agricultural Society's meetings for many years, and have gained many prizes in the "loss" "for other established breeds," and were awarded the dignity of special prize at the royal show held at Battersea in 1862. Since then they have been gaining approbation, giving evidence, as they do, of good milking properties, as well as size and symmetry, and carrying a good proportion of lean meat to the fat. Considerable attention has been paid to the improvement of this breed, and it is becoming more noted for dairy productions. The soil, climate, and treatment are favorable to their cultivation and development of all their essential properties. They are the general dairy breed of their county, which is more a grain and grazing district than dairy.

The soil is alluvial, loam and sand, fertile, with a mild climate. They are an old breed, with short legs and thick bodies, supposed to be descended from the Galloway, with native admixture.

	Pounds.
Live weight:	
Four-year old ox at Smithfield show, December, 1883 (offal, 8 pounds to the score)	2,012
Cow or heifer	1,984
Dead weight:	
Ox fed in the ordinary way	700
Cow or heifer fed in the ordinary way	640
Color.—All red.	
Climate.—Mean temperature, 49°.5.	

WEST HIGHLANDER.

This wild and fierce looking mountain ranger, with its long, shaggy hair and gracefully set long horns, is a general favorite with every grazier in the Kingdom, of which it may be said "it never lost a friend or made an enemy." The great demand and keen competition for these really hardy and picturesque animals for grazing in all parts of England leaves a very small margin for profit. They are special favorites with many noblemen, and are selected for the profitable adornment of their parks. Many are slaughtered for the use of the castle or mansion, the beef being of the choicest quality, and they harmonize well with the deer, and are the ornament of the parks through all seasons, as house protection is unknown to them unless on special occasions, where show-yard honors rule the ambition. I have seen them in their native homes and again seen the same animals shown in our southern markets before the railways were taken advantage of, fresh and vigorous after a drive of over 600 miles. Their inexhaustible staying powers are specially desirable to beef producers in distant countries where railway accommodation is not available. They mature at four years old; they are quick graziers, and produce the highest quality of beef. They average between 480 pounds and 600 pounds dead weight, according to keep, &c., but can be brought to much greater weight by artificial food and treatment. They have been bred in vast numbers in the bleak and romantic isles and highlands of Western Scotland from time immemorial and still retain their high reputation to the fullest extent for all the above properties. The grazier may not realize a very great profit for the outlay, as the never-failing demand keeps up the price, but profit is very certain as there is always a corresponding demand when fat, and they require very little attention, being grass fed; and they are free from ailments. In their mountain homes they are of a wild nature, but soon

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.....	700
.....	640

with its long, shaggy favorite with every gra- ever lost a friend or competition for these in all parts of Eng- are special favorites itable adornment of the castle or mansion, monize well with the all seasons, as house easions, where show- n their native homes harn markets before gorous after a drive ers are specially de- e railway accommo- old; they are quick They average be- cording to keep, &c., tificial food and treat- bleak and romantic mmemorial and still r all the above prop- profit for the outlay, t profit is very cer- en fat, and they re- ey are free from ail- ld nature, but soon

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yield to domestication, when they become very docile on receiving kind treatment. They give rich milk and a fair quantity, but from their high and profitable feeding qualities they are not used in regular dairies, but supply home consumption and cottagers (cotters). When prepared for our fat shows they scale great weights. Their long coats of hair, for- midable horns, and general wild appearance, render them very attrac- tive objects and add great interest to the exhibition. These animals cross well with the Shorthorn bull as well as the Galloway. The pro- duce, invariably surpassing the dam in weight, are well formed and often combine in a greater degree the milking and feeding properties. Argyleshire is the stronghold of Scots. The breed is not, however, con- fined to that county, but extends to the rugged heathery hills surround- ing, where scarcely any other kinds of cattle can exist.

Live weight:

Fully matured ox, at Smithfield show, December, 1883 (offal, less than 8 pounds to the score)..... Pounds.

Cow or heifer at Smithfield show, December, 1883..... 2,090

Dead weight:

Fully matured (average) steer when fed for market on grass..... 1,486

Heifers when fed for market on grass..... 600

Milk:

Annual average..... 520

To 1 pound of butter..... 2,500-3,000

To 1 pound of cheese..... 22

Soil.—Light loam, clay, and granite.

Climate.—Mean temperature, 48° 4'.

Color.—Red, black, and dun.

THE SUSSEX.

The Sussex are now ranking among the improved breeds, and possess all the essential character of the Devons, but resemble more the South than the North Devons, being larger in size and coarser in form. The breed may not have been so strictly kept from foreign admixture of blood, yet it exhibits as great a uniformity of character as any other breed. They exhibit a slightly nervous temperament, and are not very heavy milkers, but are good grazers, and, when fully matured, attain considerable weight. They require four years before they reach full maturity. This breed has its warm admirers as well as prejudiced opponents; it may not have obtained that public favor to cause its intro- duction into other parts of the country. This is not from any inferiority of the breed, but because the same attention has not been employed in calling forth the properties most generally valued in any breed of cattle. It is not until comparatively a recent date that the promoters of this breed have set to work in good earnest to remove defects and supply symmetry, quality, and early maturity. Those efforts have been wonderfully successful. The show of reds at the royal agricultural meeting, held in York, in July last, far surpassed any former show for quality, refined improvement, and development of important parts. Sussex being chiefly arable land, the work was formerly done both by bullocks and heifers, for which work they are admirably adapted, com- bining as they do weight of body with muscular activity. They are still used in the stiff soils of the weald. From four to eight are worked together, commencing at three years and worked until five or six, when they are fattened for the butcher. The distinctive color is red, but of a less florid shade than the North Devon. They have long, but not coarse horns; the hair and handling is not equal to that of the Devon, but

they feed to greater weights at equal ages. They are tolerably good milkers, but are not eagerly sought after for regular dairies. Their general appearance indicates that if means were used to improve them in the degree to which they are susceptible, and by judicious attention to the selection of parents to improve the progeny, they are capable of developing into good dairy and beef producers and become valuable for exportation as the foundation for a breed that is likely to be molded to the taste and requirements of future breeders and to soil and climate.

	Pounds.
<i>Live weight:</i>	
Of four-year old ox at Smithfield, 1883 (offal over 8 pounds to the score)	2,241
Weight of heifer (Smithfield, 1883)	1,890
Weight of cow, any age	2,245
<i>Dead weight:</i>	
Fully matured ox, ordinary, fed for market	840
Heifer, fed for market	720
Cow, fed for market	800
<i>Milk:</i>	
Annual average	4,000
To 1 pound of butter	24
To 1 pound of cheese	11

Soil.—Clay, loam, sandy.

Climate.—Mean temperature 50°.

Color.—All red.

WELSH CATTLE OR RUNTS.

The great improvements that have been made in this breed has brought it into prominent notice by graziers. This breed was a medium-sized mountain beast, but has now pushed to the front, and at the great Smithfield show held in London has scaled the heaviest weight of any bullock in the hall. The breed possess many of the West Highlanders properties, but lacks the hair and the picturesquely fierce appearance of those shaggy inhabitants of the Scotch hills. The Welsh give rich milk, and are extending their limits, but they are not likely to supersede the fine existing breeds or modify the character of many by admixture. They would answer well for export where hardihood is very essential and refinement not of importance. They are natives of the hilly country, where their food is the rough herbage of the mountain, where the cattle are in a corresponding degree small, but coarse and robust, and somewhat slow at arriving at maturity.

In the vale, where better natural and artificial food is plentiful, they make a greater size and answer well to treatment. It may have been a sufficient length of time distinct and uniform to constitute a well-defined breed, and a good butcher beast, but wanting in style and grandeur.

	Pounds
<i>Live weight:</i>	
Of four-year old ox at Smithfield December, 1883	2,498
Cow or heifer (offal 9 pounds to the score)	2,241
<i>Dead weight:</i>	
Average of fully matured ox, ordinary feeding	800
<i>Milk:</i>	
Annual average	3,000
To 1 pound butter	24
To 1 pound of cheese	11

Soil.—Slaty clay.

Climate.—Mean temperature, 49°·5.

Color.—All black, with strong horns.

An old breed. The improvement of modern date.

THE LONGHORN.

The Longhorn a century ago held an eminent position among our British breeds of cattle in many of our northern English counties, and was liberally distributed over Erin's green isle. They have long been on the wane, and their reputation, which had given Bakewell, the originator of the breed, years of anxious study, has passed away more rapidly than acquired; given way to animals possessing earlier maturity, milking and grazing properties in a greater degree than the once popular Long-horn.

Some spirited efforts have been made for years past by enterprising men and ardent admirers of this once-famed breed to restore them to public notice and patronage, and the result is that some splendid individual specimens are brought forward at our great meetings. The Royal Agricultural Society of England and Christmas shows encourage the breed by offering prizes for them, and they certainly attract more than an average share of attention from young farmers and sight-seers. The ponderous horns and peculiar and uncommon color, white streak down the back, a broader one on the belly, with dingy gray or mixed brown and white center pieces, and clothed with water-dog hair, render them very attractive. They give very rich milk, and formerly were good dairy cows. They attain considerable weight when fully matured, which takes at least four years. The beef is very firm and good, but not evenly distributed, and is wrapped in a thick valuable hide. They possess a strong, hardy constitution, and although confined in narrow limits, it is to be hoped those energetic patrons of the old breed may be successful in their efforts to reinstate them in all their former glories, with such modifications and improvements as will render it worthy of public notice and more extensive patronage.

Many of Mr. Bakewell's followers succeeded well with the breed by continually hiring bulls from Mr. Bakewell. One of the earliest and most distinguished adherents was Mr. Fowler, near Oxford, whose herd was sold off in the year 1791, when the following prices were realized, viz: Bull, five years old, was sold for £215; bull, two years old, for £220.10; bull, one year old, £210; bull, aged, for £215. Four cows realized £215, £273, £120, and £195, respectively.

Average dead weight of steer, four years old.....	Pounds
Average dead weight of heifer, four years old.....	800
Average dead weight of cow, aged.....	720
Milk:	800
Annual yield.....	
To pound of butter.....	3,000
To pound of cheese.....	22
	9

Soil.—Deep loam on limestone.
Climate.—Mean temperature, 49° 6.

THE AYRSHIRE.

The Ayrshire ranks amongst the best cattle for dairy purposes. It has few equals, but it is not held in high estimation as a beef beast, being small and not that kindly animal that graziers like to meet with; still they are good feeders when dry. They have an extensive circle of admirers in their own native home and surrounding counties. They are a hardy race, and are bred exclusively for dairy uses. Their Ayrshire home on the Clyde and near the Irish sea consists of moorland, hills, and in some parts undulating surface of common clay; the hills are

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Pounds.	
.....	2,428
.....	2,211
.....	860
.....	3,000
.....	21
.....	19

light, rocky, with poor herbage. The narrow valleys have sweeter food. Towards the sea there are great belts of barren sand. The climate is moist and the district greatly exposed to continued winds and humid vapors from the Atlantic. There are a few tracts of useful land, but throughout the fertility is very moderate. The Ayrshires at one time were used in our London dairies, but have been relinquished in favor of the Yorkshire or Teeswater Shorthorn. They did not come to the weight and condition after failing to be profitable for milk, and, therefore, are supplanted by animals better adapted to the system of milking and feeding simultaneously. Although the Ayrshires are very valuable dairy stock in their native homes, and it is not satisfactorily settled as to whether they do not pay best on medium and poor herbage, in some cases it has been found that when transported to genial soil and climate they begin to lay on flesh and do not increase in milk in a corresponding degree. Although of long standing, it was late in being prominently brought before the public as a defined breed, and the high qualities possessed thereby are due to the admixture of Teeswater and Jersey blood which has been introduced to their country. The great similarity existing between the Jersey breed and the Ayrshire is in the color of skin, horns, and dairy properties. The general resemblance of form is so great that a Jersey cow might easily be mistaken for an Ayrshire. The bull calves of this breed are mostly sold for veal. No breed receives more attention than this does by its admirers to keep intact and type all its properties. These animals carry the neatest bag and best formed teats of any breed. They do not carry a brilliant color, being a dingy red and white. When dry they feed well. Their greatest drawback is want of substance for general purposes, but there is no just reason why this breed cannot be greatly improved and all defects removed.

	Pounds.
Dead weight of matured heifer or cow fed in the ordinary way for market..	560
Milk: Annual average weight.....	6,000
To 1 pound of butter.....	22
To 1 pound of cheese.....	9

Soil.—Loam, clay and sand.

Climate.—Mean temperature, 48°·8.

Color.—Dingy red and white.

An old established dairy breed of Teeswater and Jersey mixture.

THE JERSEY.

The Jersey is distinguished as producing rich milk, fine colored and delicate flavored butter, for which luxury they are often kept as lady-pets in private families, but are only partially used in regular dairies to give a little coloring to the dairy products. They are to be found throughout the United Kingdom for the same purpose. Color pale red and white, but the smoke or silver-gray color is preferred; skin of orange-yellow, which is an indication of rich milk; small sized and of delicate constitution. They are not prepossessing in form, and are awkward of gait, but very docile. The surplus bull calves are fed for veal; the heifers are kept for the dairy and breeding purposes. Therefore, little can be said for the beef. Any improvement that may arise from crossing will be due to the new infusion. It would take many generations of careful culture to permanently unite and establish those essential properties in such a degree as to commend them to the public as profitable beef and butter machines. They are more fitted for amateur farmers and opulent families, than for ordinary dairy purposes, as when they have done milking there is little to carry to the reserve fund. The

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	Pounds.
for market...	560
.....	6,000
.....	22
.....	9

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prices vary more from fancy than intrinsic value, ranging from £20 to £30 for good animals, but three times that amount has been paid for them when sold at auction, and over £100 frequently for very choice specimens. They will no doubt answer all reasonable requirements if exported to genial soils and climates.

They are regular breeders and will continue to be so to a good old age, but as a natural consequence will fail to retain the quantity and quality of milk as if young and in full vigor.

Annual average of milk, 4,880 pounds; 17 to 20 pounds of milk to 1 pound of butter; quantity of milk to cheese, not known; average live weight at four years old, 896 pounds.

RÉSUMÉ—ANALYTICAL COMPARISONS.

Meat producers.—As to the profitable size of an animal, there is a great difference of opinion amongst men whose judgment and experience entitle them to great respect. Every man has his favorite breed and this in their eyes is the only breed worthy of cultivation. But we must bear the great fact in mind that the profit of breeder and feeder depends not so much upon what the animals make as what it costs making. The Hereford not infrequently pays the grazier better than the Shorthorn, but the value of a breed is not to be determined by the profit it yields between buying and selling, but by that which it yields to the breeder and feeder conjointly from its birth to maturity. The great objections raised against the Devons is said to be their diminutive size. Now, there are many specimens of the Devon breed that have scaled great weights. Mr. Hancock, of Hales, had a bullock in 1873 whose live weight was nearly 2,788 pounds, and which yielded 1,780 pounds of beef. This animal was five years old and had been worked on the farm. A well-known breeder, Mr. Hatway, had an animal of the Devon breed which weighed 1,700 pounds dead weight. There are many other individual animals which have reached extraordinary weight. Mr. Samuel Kinder's champion ox weighed alive 2,128 pounds, and gave a carcass of beef weighing 1,500 pounds. At the Smithfield Club show, in 1875, Mr. Richard Warner's cow weighed alive 2,036 pounds. These weights leave great hopes of further development in size of the general breed. Although these are extreme cases, of which many more can be referred to, they may suffice to hold out great encouragement to a beginner to make selections possessing qualities and capabilities calculated to remove the North Devons from the stigma of pigmy animals. Their dairy properties may not rank with the first, but they possess that tendency to dairy productions that give every encouragement for great improvement in that important branch by judicious selections and careful treatment.

The very best beef-producing animal in existence is the cross between the Scotch Pollies and the pure bred Shorthorn bull. This system of crossing is extensively practiced in Scotland. Ninety per cent. of the Aberdeenshire beef, so highly prized in the London market, is a cross between these two breeds. At the Smithfield Club show in London in 1880 the average increase in weight of six steers of Polled breed under three years of age was 1.78 pounds, and the corresponding class of Shorthorns show 1.79 pounds. The black Pollies will frequently realize at three years in the London Christmas fat-market from £25 to £40, and some choice specimens higher sums. If the breed were distinguished for milking in the same degree, it would be one of the most

valuable of our British breeds. The rise in this breed has within the past few years been remarkable. Good average cows will bring from £30 to £45, while better-bred families and more popular will realize from £50 to £100 on an average; some fashionable tribes ranging from £120 to £270. The average of Mr. Adamson's sale in 1881 was as follows: Fifteen cows realized over £47 each; 10 heifers averaged £47; 9 calves over £20 each; 2 bulls averaged £118. The 36 animals averaged £56 11s. each.

London dairy tests.—The result of the London dairy scientific tests may show the qualifications of individual specimens, but I do not think that a reliable annual average, either of weight of milk, proportion of milk to butter, and milk to cheese, characteristic of any breed is recorded. In fact I do not think such a statement possible to be made, as good soil, climate, and other circumstances, make great variations, even with the same animals. However carefully an experiment in such cases is conducted it can only apply individually, and is open to criticism and objections, and is not calculated to satisfactorily solve the question upon reliable information. The nearest approximation to the requirements will be gathered from general milking properties, where minute details which cannot have a general application must be taken into consideration.

In a very extensive milking dairy in Yorkshire, where every department is conducted on the best and most economical principles that experience can suggest, daily records of productions, &c., show that 2 gallons, or 20 pounds of milk per diem, through the year can be obtained from the selected dairy Shorthorns, inclusive of a few Ayrshire and Jerseys, and a couple of Galloway and Shorthorn crosses.

At the dairy show held in London, October 3, 1883, the following is the analyses of milk, with other data, on which the awards of prizes were made, which results only go to prove the foregone conclusion as to the best dairy cattle in the British Isles, the championship falling to the Shorthorns, as did also the second honor:

Breed.	Age.	Date of calving.	Day's milk.	Percent- age of solids.	Per cent. of fat.	Total award.
Shorthorn	Years.		Lbs. oz.			Percentage.
Do	7 9	May 12	51	12.06	3.85	99.12
Short-horn and Dutch	5 6	Sept. 27	47	13.29	4.71	92.65
Guernsey	7 2	July 19	63 4	12.12	2.80	91.59
Jersey	5 4	Apr. 8	18 8	14.25	5.54	87.50
Devon	4 5	Aug. 5	35 4	14.21	5.14	81.87
Ayrshire	4 6	July 4	26 8	14.75	5.28	87.80
		Oct. 3	30 4	14.18	5.12	79.81

Weights by breeds.—In pursuance of the capabilities of the recognized breeds, I will give their live weights when at the highest state of perfection which skillful treatment can bring them to, and by which it will be seen that the combined properties of milking and grazing do not exist in all renowned breeds, although the winner of the champion dairy prize on the 3d of October is of the same breed as that which carried the first prize in the same hall in December, 1883, as best fat cow in her class, and weighing 2,352 pounds, the heaviest of all female exhibits, and, what is more worthy of remark, another Shorthorn heifer a little over two years old obtained the champion prize against all breeds, weight, or sex; her live weight being 2,049 pounds.

The following table shows the live weight of two of the heaviest animals in each class, but not necessarily all prize winners, as in many instances the prizes went to the lighter animals:

Breed.	Steers (not over 2 years).	Steers (not over 3 years).	Steers (not over 4 years).	Heifers under 4 years.	Cow, 4 years.
	<i>Oct. gr. lb.</i>	<i>Oct. gr. lb.</i>	<i>Oct. gr. lb.</i>	<i>Oct. gr. lb.</i>	<i>Oct. gr. lb.</i>
Devons.....	19 2 10	14 1 4	17 2 6	14 1 4	17 1 4
Herefords.....	10 1 14	12 1 22	17 2 8	13 3 13	13 3 15
	14 0 22	17 0 24	18 2 0	18 3 37	20 3 5
Shorthorns.....	13 3 18	10 1 4	17 3 14	17 0 26	.....
	19 3 4	19 0 27	19 3	18 1 5	21
Sussex.....	13 1 14	18 3 8	19 1 20	16 3 12	19 2 13
	13 2 25	17 3 24	20 1 1	17 3 2	20 0 5
Red-Folled.....	13 3	19 0 5	18 3 2	16 3 26	16 2 6
	15 1 20	17 3 6	17 2 4	.....	.....
Scotch Polled.....	14 1	15 1 20	14 3 6	.....	.....
	.....	19 1 4	21 0 23	17 2 23	.....
	.....	18 1 10	19 0 22	14 1 10	.....

Highlanders (any age): 19 cwt. 1 qr. 1 lb.; 17 cwt. 2 qrs. 13 lbs.; 14 cwt. 5 lbs.; and 13 cwt. 2 qrs. 10 lbs.
Welsh oxen (any age): 22 cwt. 1 qr. 6 lbs., and 19 cwt. 3 qrs. 2 lbs.

Special excellences.—After making special remarks on the merits and demerits of the various British breeds of cattle which are recognized by the Royal Agricultural Society of England and protected by herd-book records, there are incidents and freaks of nature which are in some degree calculated to mystify the opinions of the inexperienced. For instance, there is the enormous weight of the Devon oxen, which is not characteristic of the breed. The same thing occurs in Welsh Runts. The pure Devon is a small, compact, hardy animal, of fine quality, medium milker, of rich quality. The Hereford is of large size; good grazer; inferior in milk yield. The Shorthorn, great size, good grazer, superior milker. The Aberdeen, compact, with good size; good grazer and medium milker. The Galloway, slightly smaller than the Aberdeen, but very compact in form; medium milkers, of rich quality. The Highlander, small and compact; milk rich, and fair quantity for size, but not often used for dairy purposes; they are bred on the hills, run together and reared in the same manner as mountain sheep; their beef is of the finest quality. The Ayrshire, small-sized, bred for dairy purposes, in which they excel; good grazers, but, as very few steers are kept, little is said about the quality or weight of beef. The Jersey, small, deer-like; gives rich milk and fine quality of butter; no pretensions to beef-producing. The Welsh, useful dairy animals; over medium size; milk, rich; vary according to food and treatment; not so rich and graceful in general appearance, but a good, sound, hardy animal. The Sussex, great size, fair milkers, good grazers; for this breed there are great hopes of further distinction. The Longhorn, large frame, hardy, and good grazers; formerly good butter and cheese producers. The Norfolk Pollie, thick, chubby animals; good dairy cows and grazers, but do not possess that graceful figure that characterizes the Northern Pollies; it seems to be fighting its way to greater popularity; some attention has been paid to them by foreign buyers. The Guernsey belongs to the same group of islands as the Jerseys, and possesses the same dairy properties, giving a little more milk, and is heavier in carcass, but plainer in form.

Per cent. of fat.	Total award.
Percentage.	
3.85	90.12
4.71	92.05
2.80	91.59
5.54	87.50
3.14	81.87
5.28	87.80
5.12	79.81

CONCLUDING RECOMMENDATIONS.

Before concluding, it may not be deemed inexpedient to introduce a few qualifying remarks that may not produce any detracting influence, but have a tendency to establish confidence in my experience and humble endeavors to give a correct and unbiased description of the capabilities of the various breeds of cattle referred to in this report. For many years I had the entire management of the extensive and distinguished herd of Shorthorns belonging to the late Earl of Ducie, Gloucestershire, as well as the Herefords, Scots, and Jerseys, which were kept more as experimental auxiliaries than for the permanent establishment of the breeds. I established a considerable herd of selected Shorthorn cattle for Napoleon III, and although they were located in the two extreme temperatures, they answered admirably, and just as their influence was beginning to be felt in France their further development and usefulness were suddenly cut short by the unfortunate Franco-Prussian war. I also formed, and for many years superintended, the well-known herd of Shorthorns belonging to Colonel Gunter, in addition to Galloways and other smaller herds of different breeds, and have acted on nearly three hundred occasions as judge of stock at agricultural societies in the United Kingdom. My remarks, therefore, as far as possible, are founded on facts obtained by long experience, and I am actuated by no motive or interest beyond a desire to submit this report with as much truth and as few errors as my abilities will allow.

I have for forty years given my undivided attention to breeding and feeding of nearly every description and breed, during which time I have shipped to all quarters where British breeds are to be found, and have had more than ordinary opportunities afforded of acquiring a thorough practical knowledge of the true merits of the various breeds. I have always found the Shorthorn, Hereford, Devon, and Scotch Polities answer admirably when exported to Australia, New Zealand, South America, the United States, and Canada. I entertain a very high opinion of the Sussex cattle for exportation. There are many other English breeds, but I think I have named the animals best adapted for other climates. The Norfolk Polities answer well with liberal keep, but cannot rough it with the Scots. The Highlanders, on account of their wildness, have not often been tried, but they can easily be subdued and brought to be very gentle.

The full details of the properties of our best British breeds of cattle are embodied in the separate reports under the different heads, which facts strongly support my confident recommendation of the following breeds as the best adapted for exportation to the United States and Canada, viz, Shorthorns, Herefords, Devons, Galloways, Aberdeens, and Sussex. These animals possess strong, robust constitutions, and other essential properties abundantly fit them to fully maintain their reputation when suitably located, and every breed named is capable of further development under circumstances more favorable to their varied habits. The Scotch Polities can stand severe climates with inferior food, and the heavier cattle will freely respond to the rich fare of the plains. Where milk and butter are made specialties the Jersey and Ayrshire are invaluable. The West Highlander, if once located in the United States, would gain freely where the climate did not necessitate the winter housing. The Shorthorns are very ungainly, both by rail and ship, owing to their ponderous horns.

PRICES OF BRITISH CATTLE FOR EXPORT.

The prices at which really good formed animals ought to be purchased will vary a little according to age and other circumstances.

The subjoined list contains the prices at which genuine good animals of the different breeds can be obtained :

Shorthorn cow or heifer, with pedigree	£35 to £50
Hereford cow or heifer, with pedigree	35 50
Devon cow or heifer, with pedigree	30 45
Galloway cow or heifer, with pedigree	25 40
Aberdeen cow or heifer, with pedigree	30 45
Ayrshire cow or heifer, with pedigree	20 35
Sussex cow or heifer, with pedigree	30 40
Norfolk cow or heifer, with pedigree	36 40
Jersey cow or heifer, with pedigree	20 30
Welsh cow or heifer, with pedigree	20 30
Loughorn cow or heifer, with pedigree	30

If noted blood and renowned fame are required, higher prices would have to be paid; and all breeds have favorite families and lines of blood which do not in all cases arise from any greater excellence they possess.

HOW TO SELECT CATTLE FOR EXPORT.

In selecting animals for export a saving of 20 per cent. can be effected by knowing the breeders as well as the breed, and devoting sufficient time for due examination. Limited time and hurried selections is often followed by disappointment to the purchaser, and throws discredit upon the breed when landed on foreign shores. I think it quite practicable to purchase half a dozen choice specimens of each breed with authenticated pedigrees, including young bulls to match, and delivered in New York free of all charges for the sum of £50 each. Liverpool to New York or Portland is the best route. Passage of cattle, including food and water, £6 per head; insurance from 10 to 12 per cent., according to the season of the year and vessel employed. The charge for man to attend upon them is regulated by the number of cattle shipped.

JOSEPH LAY FAULKNER, M. R. C. V. S. L.,
Veterinary Surgeon.

SOUTH MILFORD, COUNTY OF YORK,
West Riding, England, January 3, 1884.

JERSEY CATTLE.

REPORT BY CONSULAR AGENT RENOUF, OF JERSEY.

The breed of horned cattle in the Island has long been known, and is in many respects remarkable. The important peculiarities are the small size and delicate frame of the animals, the large quantity and rich quality of the milk they yield, and the yellowness of the fat, and of the butter made from the milk. The first result may, no doubt, have been produced by the habit of breeding in and in, which has long since been carried to such an extent that each island has its own breed, which may not be mixed on any consideration whatever. Perhaps the same cause combined with the practice of tethering, the pampering with various kinds of food, and the climate may be sufficient to account for the other peculiarities also. Although very small, many of the cows are remarkable

for symmetry, and they rarely show vicious temper. They have a fine curved taper horn, a slender nose, a fine shin, and deer-like form. Of the different island breeds the Alderney is the smallest and most delicate, and the Jersey is somewhat larger, but not very different. The Guernsey cattle are larger boned, taller, and stouter in all respects, and have a less fine coat. The color of the coat is very various, being commonly red, red and white, gray and white, or cream colored, but there are good beasts of black, and black and white color, with a dingy ridge down the back. All the cattle are yellow round the eyes, and within the ears, and this peculiar tendency, it has been already remarked, is accompanied by a similar color of the butter made from their milk, and of their fat when killed. The cause of this peculiarity of color has been an object of much unlearned and learned speculation. It is evident that the milk is not the only secretion of a yellow color, for in addition to the eyes and ears being tinted, it is one of the peculiarities of the best animals that there is a yellow tinge at the root of the tail. It has been suggested that the color is derived from bile, but yellowness is not the essential character of that secretion. Its properties are to be bitter, carbonized, and to perform certain functions in the animal economy. Colorless bile is possible, and so, beyond a doubt, is yellowness without bile. But that the coloring matter of the milk and tissues of the Channel Islands cow may also be the coloring matter of the bile is an hypothesis which no physiologist would condemn, so is the doctrine that the near vicinity of the sea may supply an excess of soda in the grass, and that the practice of closely tethering, by limiting the amount of exercise, may engender a tendency to something akin to bile, if not bile itself, to be in excess. The large yield of milk from the island cows and the richness of the milk for butter are well known. Extreme cases show that from 16 to 17 pounds per week of butter have been made from the milk of one cow. The cattle are fed in the ordinary way, and milked three times a day. Each cow requires about $1\frac{1}{2}$ English acres of grass land, and is fed during winter, from the beginning of November, on mangel-wurzel, turnips, parsnips, and hay. Good cheese can be made from the milk, but it is not manufactured for sale.

THOMAS RENOUF,
Consular Agent.

UNITED STATES CONSULAR AGENCY,
Jersey, February 20, 1885.

*Products of Jersey cattle **

[Inclosure in Consular Agent Renouf's report.]

Name of breed: Jerseys; annual average pounds of milk: 2,400; milk to pounds of cheese: not made, milk being too rich; name of country: Jersey, Channel Islands; size at maturity: cow: length, 7 feet; girth, 6 feet; height, 4 feet 2 inches; bull: length, 7 feet; girth, 6 feet 10 inches; height, 4 feet 6 inches; live weight of cow: 1,000 pounds; live weight of bull: 1,200 pounds; age at maturity: 3 to $3\frac{1}{2}$ years; weight of meat at maturity: bull, 800 pounds; cow, 580 pounds; origin of breed: Jersey, no animals being allowed to be imported except for slaughtering purposes, so that the breed is kept pure; few cows are slaughtered at maturity or in condition; if barren they do not feed well, and when in milk difficult to fatten, owing to their great yield of milk; the average price of butter is 1s. 3d. per pound.

Topography: Altitude, 139 feet above sea level; mean temperature, $51^{\circ} 9'$; maximum, $87^{\circ} 7'$; minimum, $21^{\circ} 3'$; soil: loam, clay, sand, and gravel.

*The Jersey pound is $\frac{1}{4}$ per cent. heavier than the English pound.

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Substratum: According to locality, granite, clay, and red gravel. Cultivated grasses: Timothy and lucerne in small quantities, about one-third to two-thirds clover, rye-grass.

Methods of housing.—Well appointed and warm stables with good straw litter in winter. In summer they are left in the fields except in bad weather.

Feeding.—From spring to autumn they are tethered in the fields to rye-grass and clover; in winter they are fed on hay, turnips, mangel-wurzel, and arsnips.

Handling products.—The milk is kept in clean dairies, and churned twice a week; no cheese is made when cows are in full milk; they are milked three times daily.

CATTLE IN CORNWALL.

REPORT BY CONSUL FOX, OF PLYMOUTH.

In answer to Department circular, I beg to state that I employed special agents, who were considered most likely to be able to procure information as to breeding cattle, but regret to add that, except in two instances, they have been altogether unsuccessful in their efforts. They report that there exists, on the part of farmers generally in this district, either a reluctance to afford information on the subject, or a want of sufficient data to enable them to give the desired particulars with such accuracy as would make them desirable.

I inclose form, which contains particulars obtained from a large breeder, and copy of a letter from a large farmer, who replied to the application made to him, not in the form attached to the circular, but by general remarks, in the form of a letter.

HOWARD FOX,
Consul.

UNITED STATES CONSULATE,
Plymouth, July 25, 1884.

SPECIAL STATISTICS CONCERNING CATTLE IN CORNWALL.

[Supplied by Mr. T. Hosken, of Looe, Hoyle, Cornwall.]

Breed: Shorthorn.

Milk: Keeps no account of milk, cattle being reared for breeding purposes, and usually sold at two years old. Dairymen pay attention to milking qualities in breeding.

Live weight: At maturity: cow, 12 cwt.; bull, 23 cwt.

Topography: Altitude: 200 feet above the level of the sea. Temperature: mean, 50.5; summer, 56.2; winter, 41. Soil: Top soil a sandy loam.

Substratum: Sandstone, marl, and clay, with spar.

Cultivated grasses: Timothy, red and white clover, rye, and cocksfoot.

Housing: Store cattle in open boxes; turned out every day for exercise except in very severe weather. Feeding cattle, in close houses well ventilated.

Feeding: Fed on roots, hay, chaff, and a little meal.

Mr. Joel Rowe, farmer, to Mr. Cock.

[Inclosure in Consul Fox's report.]

GARE LAMORRAN, November 20, 1883.

I have been looking over the paper (tabulated form) you sent me, and I am very sorry that I am not able to fill it up, as I would take a good bit of trouble for Mr. Fox. I have no idea as to the amount of milk a cow would give in a year. It would depend on the breed and the size of the cow. Jersey or Guernsey would be the richest

milk, and the most and best butter, according to the milk, but I think a cross-breed cow would produce more in the year, being a larger bullock, and would come to the butcher with more weight when finished.

I can only refer to our own county. The climate varies so much at the same altitude that we must study our own particular farms as to what breed we ought to keep, and I presume it would be the same in America. Shorthorns will not do at all in the north of our county because it is so bleak and cold. Their bowels are so lax they become thin and poor, but here in the south, on the best and most sheltered land, they do very well. But I believe the Devons and Herefords are the most profitable for feeding purposes, having less bone and more beef in their best cuts, and being more hardy. They can bear the frequent changes of weather better than the Shorthorns. They are not so lax in their bowels, and do not require so much nor such good food. I should think the bullocks of Cornwall paid the farmers from £5 to £6 per head per year, without corn or artificial food, but of course the milking cows pay more. Then the cost of labor would be more.

I am, &c.,

JOEL ROWE.

CATTLE IN SCOTLAND.

REPORT BY CONSUL WELLS, OF DUNDEE.

In submitting herewith a "Report on breeding cattle," I have to state that I have consulted many of the leading cattle breeders of high standing in this district, inspected several herds, and procured all the information within my reach in relation to the subject. I have secured photographs of representative animals of the several breeds, and given a short history of them. The photographs will be found to convey a more accurate description of the animals than cuts or lithographs. I am under obligation to William Smith, esq., of Benholm Castle, Kincardineshire, for the information he gave me regarding dead and live weight of stock and kindred matters; also to J. W. Barclay, esq., member of Parliament for Forfarshire, Scotland, who is a practical farmer, owning a considerable herd of pure Polled Angus cattle on his farm at Auchlapan, Aberdeenshire, and is chairman of the Arkansas Valley Land and Cattle Company, which has a herd of 25,000 head in Colorado. He has recently visited this ranch and there introduced Polled Angus and Galloway bulls. Mr. Barclay is a recognized authority on cattle breeding and agricultural matters, and accordingly he has favored me with information relative to "the best animals to export to the United States," "the purchasing price of the animals," and "the best means of increasing the exports of meat to this country from the United States." To Thomas Ferguson, esq., of Kinlochtry, near Coupar Angus, and others I am particularly obligated for valuable information regarding the Polled Angus and other breeds of cattle within this district. Mr. Ferguson has been a contributor to various agricultural papers in Great Britain and America, and has received prizes for reports and essays on agricultural subjects, and was the first to direct the attention of American stock breeders to the superior merits of the Polled Angus cattle. He has made the breeding of cattle a specialty for the last forty-five years, and has now one of the finest herds of Polled Angus cattle in Scotland.

The different breeds of cattle in this district are the Polled Angus, Shorthorns, Ayrshire, West Highland, and Polled Galloway. A very small number in the aggregate of the Alderneys and Jerseys are to be found in the parks of noblemen, but the five breeds mentioned, with their crosses, undoubtedly constitute the staple cattle in this district.

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JOEL ROWE.

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THE POLLED ABERDEEN OR ANGUS BREED.

The farmers of Aberdeenshire, it is stated, have done much to improve this breed and to make its beef famous in the southern markets. The number of this breed of cattle in Aberdeenshire is said to be greater than in all the rest of Scotland, and that district produced the man that obtained the largest number of prizes awarded to any one man for excellence in this breed, viz, the late Mr. William McCombie, of Tillyfour.

In Aberdeenshire there are many celebrated breeders of this stock. Among the prominent ones may be mentioned Mr. G. Wilken, of Watterside, of Forbes, who owns an extensive herd, and who has sent nearly 1,000 head of these cattle to the United States and Canada within recent years. It has just been publicly stated in the Scotch newspapers that this gentleman has been offered and refused \$50,000 from America for the privilege of picking a hundred head from his valuable herd of this breed. The following lithographs show specimens of the breed from Mr. Wilken's herd.

This breed ranks as one of the highest, if not the highest, of beef, producing cattle in Scotland, and are called Polled Angus for the reason that they are without horns (polled), and were first raised and bred in the territory called Angus, which lies along the base of the Grampian Hills, embracing the Strathmore Valley, and extending north nearly to Aberdeen. These ancient cattle remained in their native state from time almost immemorial until comparatively recent date. They were originally of all colors and shapes. In the year 1808, the late Mr. Hugh Watson, of Keillor, near Coupar Angus, whose herd had been owned by his ancestors for hundreds of years, began to try to effect some improvement in the meat-producing capacity of his cattle, and his efforts were crowned with remarkable success. Mr. Thomas Ferguson also inherited a herd of cattle from his father, whose "Doddies" (as these cattle were called) had been closely bred for generations without any change of sires, only the calf from the best cow being retained as a bull. In 1839 Mr. Ferguson purchased some heifers from Mr. Watson, and in years subsequently some more bulls and heifers, and finding them so much superior to those he received from his father, he immediately commenced breeding the Keillor cattle, and from that time till now has made the breeding of Polled Angus cattle a business. He adopted what is called the "in and in" line of breeding for more than thirty years, rarely going outside of his own stock for fresh blood, and it is by this system that he attributes his success as a breeder.

I visited this gentleman's farm, called Kinnoehtry, situated in the beautiful and fertile valley of Strathmore. His home farm comprises 420 acres, for which he pays a yearly rental of \$8 per acre. In addition to this rental he is at great expense for artificial fertilizers, stocking his farm, paying servants' wages, &c., yet he has made stock-raising profitable, and he informed me that he realized this year from his cattle alone over \$20,000. He has a herd of over 100 head of very fine pedigreed Polled Angus cattle, consisting of 2 stud of bulls, 41 cows, and the remainder calves and yearlings. He stated that he had just sold 20 bull-calves to Mr. George Whitfield, of the Government model farm, Canada, for \$300 each.

The beef of the Polled Angus cattle is of a superior kind; it gives a very high percentage of dead meat to live weight; in butcher's phrase, "it dies well and cuts up" admirably. The cattle are in general form lengthy, deep, wide, and even-proportioned, and are docile in disposition, easily kept, and come to maturity early. They are hardy and

rigorous, and can adapt themselves to most all climates. They are uniformly black in color. When well fed they mature at from 24 to 28 months. The average weight of 2½-year-old steers is about 1,000 pounds dead weight, and will bring in the Scotch and English markets from \$150 to \$200 each. They are more particularly distinguished as beef producers than for being suitable for the dairy, being only fairly good as milkers. They are bred and raised extensively in the northeast of Scotland.

Mr. Barclay, member of Parliament for Forfarshire; Mr. John Hannay, of Gavenwood, Banff; Mr. Hume, near Brechir; Mr. T. M. Nicoll, of Littleton, Kirriemuir, and several others have paid great attention to the breeding of Polled Angus, and have now excellent herds of these cattle.

The bull shown in lithograph No. 1 is Prince of the Realm, bred by Mr. Ferguson at Kinlochtry, now the property of Mr. John Hannay, of Gavenwood, Banff, Scotland. This bull while in the possession of the breeder gained a first prize at the Highland Society's show at Kelso in 1880, as a two-year-old, and the first prize at the same society's show at Glasgow in 1882, besides a number of champion prizes in minor shows. At Glasgow, at the age of four years and fourteen days, he weighed 2,600 pounds, with a heart girth of 8 feet 5 inches. Since he passed into Mr. Hannay's possession he has gained other prizes and champion plates. He has been spoken of as one of the best Polled Angus bulls which has been seen for years.

THE POLLED GALLOWAY BREED.

This breed is black and polled like the Angus, but in disposition and maturing properties it more resembles the West Highlander. The Galloways may be described as the cattle of the Southern Highlands, while the West Highland cattle occupy the northern Highlands of Scotland.

The following interesting report on Polled Galloway cattle was prepared for me by the council of the Galloway Society of Great Britain:

POLLED GALLOWAY BREED.

[Report prepared by the council of the Galloway Cattle Society of Great Britain for Consul Wells, of Dundee.]

This breed of polled cattle took its name from the province of Galloway, which now comprises the two southwestern counties of Scotland. Pedigreed herds of this breed are principally kept in Galloway and Dumfriesshire, in Scotland and in Cumberland, the most northwesterly county of England. The origin of the Galloways is lost in the mist of antiquity. An allegation has never been made in any well informed quarter that they are not an original and distinct breed of cattle. From time immemorial they have been polled or hornless. There is a tradition mentioned by some writers that in remote ages they were provided with horns, but it is nothing more than a tradition, for in the earliest notices of the breed, centuries ago, there is no allusion made to their being horned. So emphatically are they a hornless breed that it is a certain mark of an animal not being a pure Galloway if it has the smallest trace of horns. The Galloway breed of cattle was improved as early as if not earlier than any other breed of British cattle. Immediately after the union of England and Scotland an extensive demand sprang up from the southeastern counties of England for Galloway cattle, and this induced the breeders to make great efforts to improve their bovine stock, in which they were very successful. This improvement was brought about not with crossing with other breeds, but in breeding from the best and handsomest of both sexes, and by feeding and management. The improvement effected during the present century has been great, and it has been brought about by the same means, namely, by systematic and skillful mating of the best specimens of both sexes, and

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POLLED ANGUS BULL PRINCE OF THE REALM



W. & A. Smith & Co. Ltd.



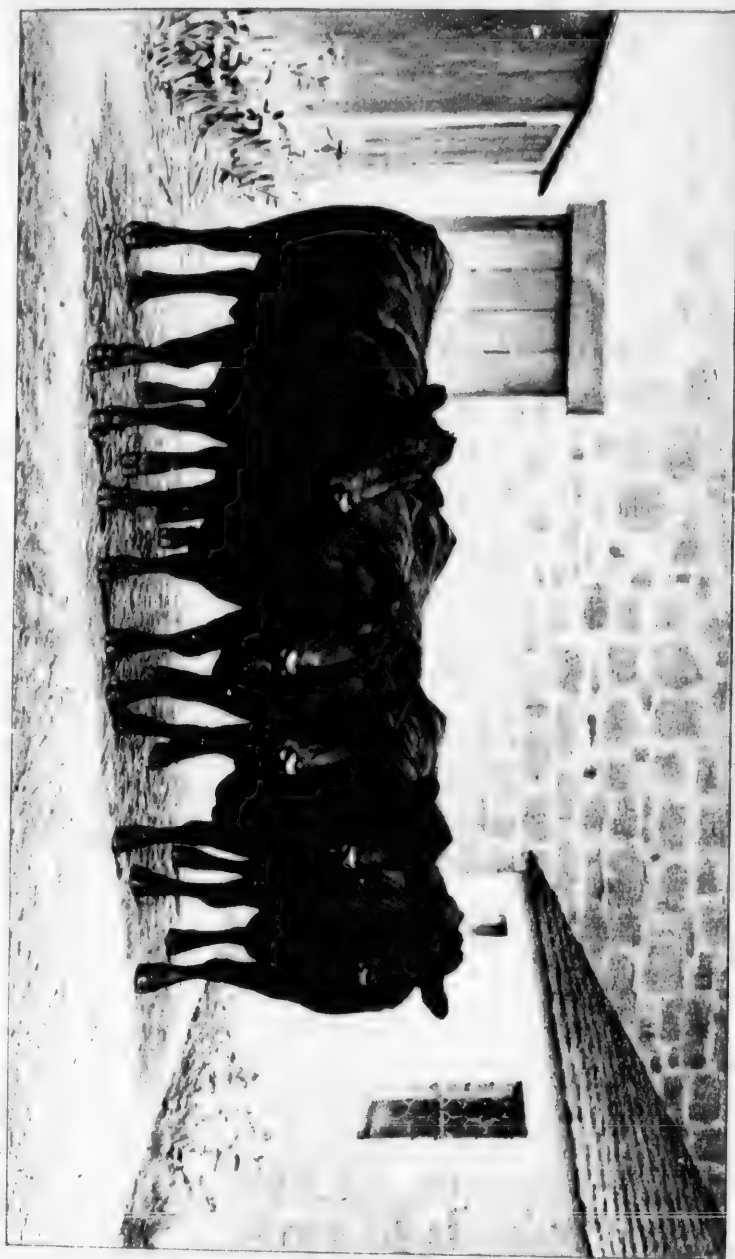
POLLED ANGUS YEARLING "FAVONIA"



FAVORITE AT THE AGE OF 2 YEARS.



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COLLED ANGUS HEIFERS, KINOCHTRY BREED

PRIZE PLATE AT TURNIRP AC AND BOUGHT AT PUBLIC SALE IN 1893 FOR \$1240



AT TURNER'S SALES, BOSTON, AND SECOND PRIZE AT PUBLIC SALE IN 1853 FOR \$240

A JOURNAL OF THE
PROCEEDINGS OF THE
SOCIETY OF AGROLOGISTS
1911



POLLED ANGUS HEIFER "PRIDE OF ABERDEEN"

A TWO YEAR OLD HEIFER OF THE POLLED ANGUS BREED
BORN IN ABERDEEN, SCOTLAND, 1911

RESERVED FROM A...
BRED BY AND THE PROPERTY OF MR. MARY...
...PRINCESS



POLLED ANGUS HEIFER CALF "PROSPERA PRINCESS"

REGISTERED FROM A. J. COWLEY, FARM, WYOMING, U. S. A.
BRED BY AND THE PROPERTY OF MR. J. M. W. WYOMING, U. S. A.

PRIZE COW "BLACKBIRD" OF CORNELL ET. SHOW SALE FOR 1897



WORLD ANGLIC TWO YEAR OLD HEIFER BENEFIT
PRIZE COW "BLACKBIRD" OF COMBETTE ST. ANTON 3000 LBS 1000 1000 1000

POLLED ANGUS HEIFER CALF "VIGNETTE"

WON THE FIRST PRIZE AS ONE OF THE BESTIVE HEIFER CALVES IN STATE 1904



POLLED ANGUS HEIFER CALF "VIGNETTE"

WON THE FIRST PRIZE AS ONE OF THE BEST FIVE HEIFERS CALLED BY NAME

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POLLED ANGUS BULL CALF "ALLEGRO"

TWO YEAR OLD POLEED ANDUS HETTER
BUND BY ARRESTED PROPERTY C. MR. TROUSON, KINCORNEY



TWO YEAR OLD POOLED ANDUS HEIFER
BRED BY AMERICAN HORSE RACING CO. IN VERMONT, MINNESOTA

POLED ANGUS BULL THE SHAH





Miss B. B. B. 1884

POLLED GALLOWAY COW

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POINTED GATEWAY BRILL

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also by attention to diet and general management. The Galloways, as a breed, cannot lay claim to any superiority as milkers. Their milk is rich in quality, but the quantity they give is not large. However, the milking faculty runs in some strains, and individuals of them are excellent dairy cows. It is mainly as a beef-producing breed that Galloways have made a name for themselves. The quality of their beef is similar to that of the Aberdeen, Angus, and West Highland. The beef of these three breeds ranks as "prime Scots" in the Smithfield and other leading British fat markets, realizing there the highest current rates. Its superiority arises from the fact that it is well marbled, the fat being well intermingled with the lean.

In respect of proportion of dead to live weight Galloways kill unusually well, matured animals of the breed being estimated by experienced butchers to dress upwards of 60 per cent. of their live weight. Galloways arrive at maturity when from two to three years of age, according to the way they are kept when young. A well-fed Galloway may be estimated to weigh when two years and nine months old 1,600 pounds live weight, and 1,000 pounds dead weight. Many weigh more, but others reared under adverse circumstances are less. No cattle in Britain are harder than the Galloways except the West Highlanders, and the difference between these two breeds in this respect is very slight. In all improvements of the breed the retention of this ancient characteristic of them has been successfully kept in view. While their skin is mellow to the touch it is moderately thick. Moreover the profusion of long, soft hair, with a thick, mossy undercoat, which has always been characteristic of this breed, conduces to and is symptomatic of their exceptional hardiness. The Galloways are kept on the low-lying farms, where mixed farming, grain-growing, and cattle breeding and feeding are practiced, and also on the intermediate hill grazings between the high mountains and the lower valleys. Many herds are located in hilly districts where the climate is so severe and cold that the growth of the cereals is not attempted. A large number of young Galloways are wintered in the open air, "the sky and the hills and the glen," as has been said, being their only winter shelter. This system is pursued not from scarcity of house accommodation but of deliberate choice, it being found by experience that from their hardy nature and being inured to exposure they are not only able to stand the severities of the climate, but that they thrive better and make more progress during the succeeding summer and autumn when wintered in the open air than under cover. It is a valued characteristic of the Galloways that they thrive well when kept upon poor and scanty fare, and indeed they have long proved themselves able to stand adverse circumstances, whether these arise from soil or climate or both. They are remarkably impressivo as a breed, which is no doubt due to the length of time—at least nearly two centuries—they have been bred from animals of the same type and possessed of the same characteristics. Alike in respect of color, absence of horns, and general outline and symmetry, their offspring from cows of other breeds so very closely resemble the black Galloway Poll that it is not easy to distinguish a pure from the cross-bred animal.

When the Galloway bull is put to horned cows of any breed from 95 to 100 per cent. of the produce are found to be black and hornless, and in stamping their offspring with their qualities otherwise the prepotency of the Galloways is very marked.

Galloways have long been in great favor for crossing with other breeds.

Bulls of this breed have been very extensively put to both Short-horns and Ayrshire cows, and in England especially it has been a favorite and highly successful mode of crossing for beef purposes to use the Short-horn bull on the Galloway cow. By either mode symmetrical cattle of large frames are produced. They are hardy and their meat is free from patchiness, well mixed and superior. These Galloway crosses mature early and reach very heavy weights. A Galloway cattle society exists, its two main objects being (1) to maintain unimpaired the purity of the breed of cattle known as Galloway cattle, and to promote the breeding of these cattle, and (2) to collect, verify, preserve, and publish in a Galloway herd-book the pedigrees of the said cattle and other useful information regarding them. The headquarters of this society are at Dumfries, Scotland, and it has published eight issues of the Herd-Book.

Both of these animals (Nos. 15 and 16) are first-prize winners at the Highland and Agricultural Society Show of Scotland, and are the property of and bred by Mr. James Cunningham Yarbrough, of Dalbeattie, Scotland.

THE AYRSHIRE AS DAIRY CATTLE.

I have been supplied with the following information regarding this breed:

The Ayrshire is emphatically the Scotch dairy breed, and a thoroughly thrifty dairy cow, and one that will fatten rapidly when dry,

* Here follows a statement concerning the true characteristics of the Galloway breed, which was not published for the reason that a similar statement appears in the report from Leith, to which the reader is referred.

has few equals. The origin of this breed is difficult to trace; no particular men seem to have stood out conspicuous from their fellows as breeders or improvers. The chief excellence of the breed is supposed to have arisen from the peculiar circumstances of climate, soil, and situation of several of the western counties of Scotland. The farmers in these districts noted the points that indicated good milkers, and, as a consequence, the best milking cows were put to good bulls, and in this way a very superior dairy breed has been established in the west of Scotland, and spread rapidly over most other parts of the country. No breed of cattle in Scotland will produce an equal quantity of milk, butter, and cheese to the Ayrshire. Many cows, when in their best condition and well fed, will yield 3 gallons per day for three months, and produce a total of from 500 to 700 gallons per cow per year; 600 gallons per cow for the year has been considered an average on good farms. The proportion of milk to butter and cheese, the standard recognized in Ayrshire, is about (in imperial British gallons) 2½ gallons of milk to 1 pound of butter, and 1 gallon of milk to 1 pound of cheese. The average weight of a gallon of milk is 10 pounds 8 ounces, and the following figures show the result of a milking competition at Ayr on the 26th and 27th days of April, 1861:

Name of owner.	Greatest milk ing.	Average of four milking.	Weight of milk.
	<i>lbs. ozs.</i>	<i>lbs. ozs.</i>	<i>lbs. ozs.</i>
A. Wilson	28 12	24 34	112 14
J. Brown	26 0	24 7	104 0
W. R. D.	25 7	20 8	102 14
R. Watson	24 14	17 14	94 14
W. Brown	23 15	17 14	94 14
R. Wall	22 5	14 8	88 14

In the above competition the greatest yield at a single milking was rather over 3 gallons, which produced at the rate of 15 pounds of butter per week.

Being a competition, and the cows highly fed, the returns afford a fair criterion of the ordinary milking capacity of an Ayrshire cow. The distinct classes of cows might be selected from among the Ayrshires—butter and cheese makers. Many cows, however, combine both the butter and cheese-making faculties in a remarkable degree. Compared with the Polled Angus and Shorthorn, the Ayrshire is a small breed, but it is said that when crossed with a bull of either of the two breeds mentioned, the produce is an animal admirably adapted for maturity, early and fattening rapidly. The color of Ayrshires is generally of a red and white in spots; sometimes white and black, or red or brown. The horns are fine and twisted upwards. The face long, with a keen yet docile expression.

The figure of the body, enlarging from the fore to the hind quarters, broad across the loins; the back straight; the tail fine, long, and bushy at the extremity; the udder white and capacious, coming well forward on the belly; the teats of middle size, set equally and wide apart from each other; milk veins prominent and fully developed.

THE WEST HIGHLANDS.

This hardy breed of cattle may be stated to occupy as its home the whole of the West and Middle Highlands of Scotland and the Western Islands. No cattle are possessed of more distinctive and strong

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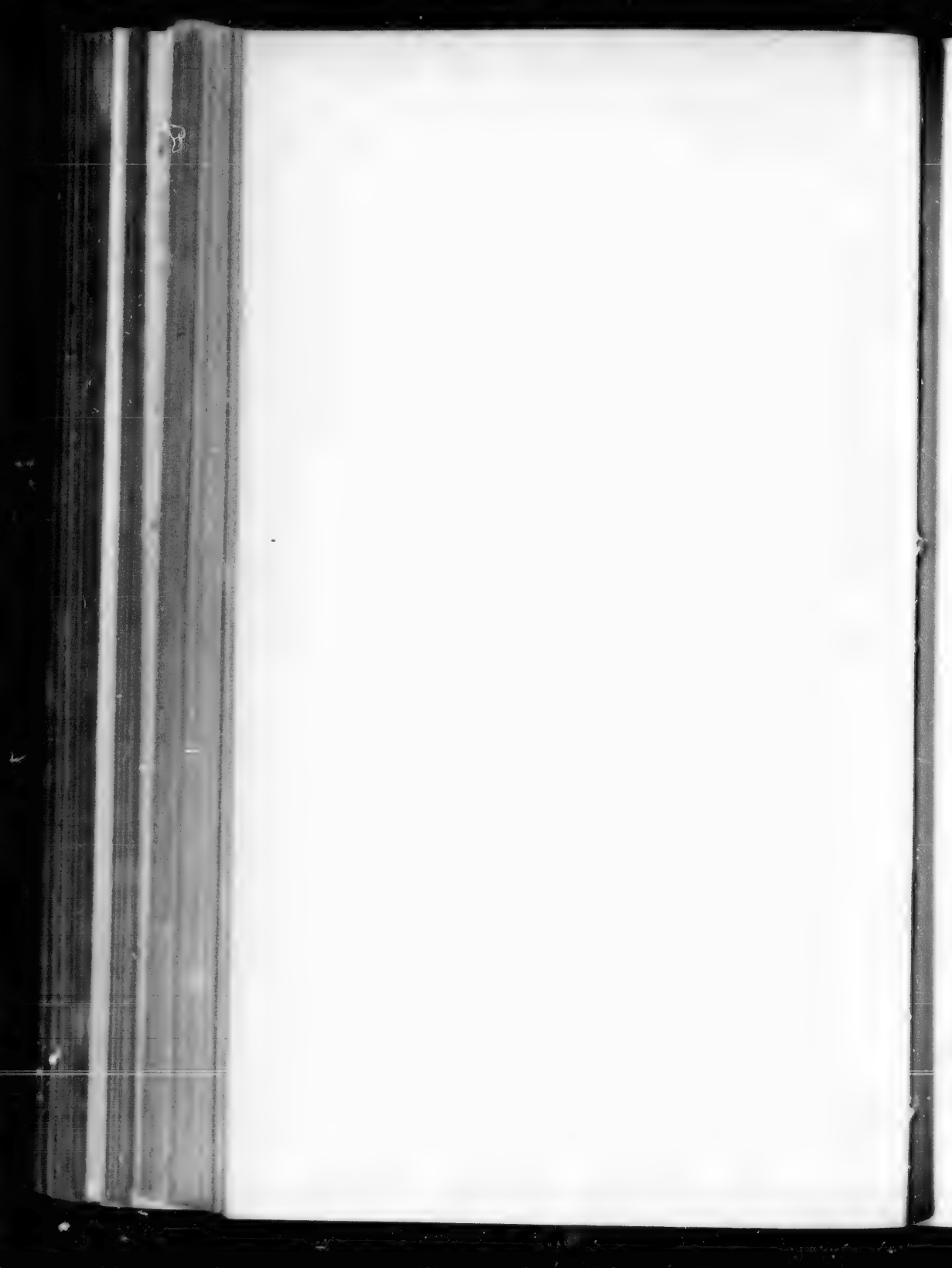
BOYS THESE ANIMALS ARE CONSIDERED VERY FINE SPECIMENS OF THEIR BREED



BOTH THESE ANIMALS ARE CONSIDERED VERY FINE SPECIMENS OF THEIR BREED











Julius Ben & Co. Inc.

SHORTHORN PRIZE BULL





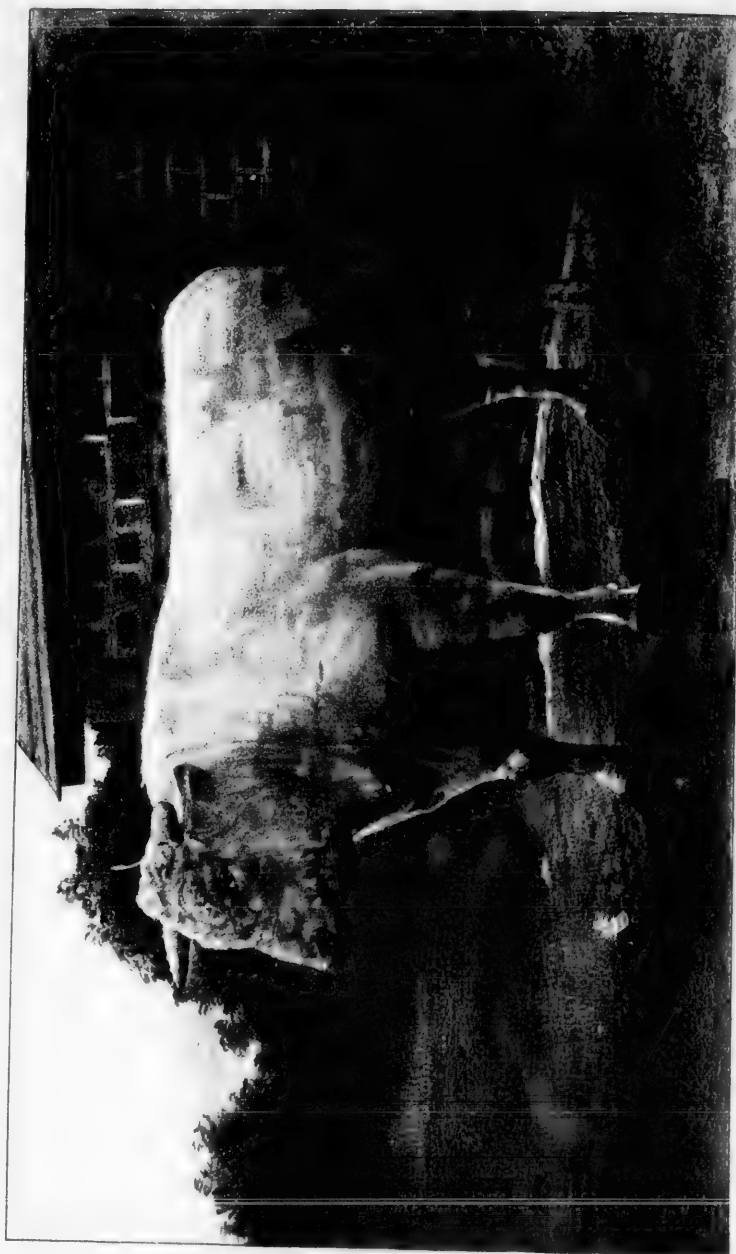
U.S. BUREAU OF AGRICULTURE

SOUTHERN COW "ROSA BONHEUR"

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SOUTHERN COW ROSA BONHEUR





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marked features than this breed. Their limbs are short, but muscular; chests wide and deep; ribs well developed and fairly arched; backs straight; neck and dewlap somewhat coarse in the bull; horns of great length, spreading and tipped with black; colors various—brindle, dun, cream, red, and black. They give only a small quantity of milk, and are very slow in arriving at maturity, not becoming ripe until the age of five or six years. Their beef is of a very superior quality and their hides make the best of leather.

SHORTHORNS IN SCOTLAND.

Shorthorns, as their name denotes, have short horns, and in color they vary from pure white to a deep or rich red. The most popular color for these animals in Scotland is a mixture of the two, forming a deep or light roan, sometimes called strawberry, flecked, or hazel.

Shorthorns are as symmetrical as the Polled Angus, and grow about the same weight. They are hardy and arrive at maturity early; but, like the Polled Angus, they are principally noted as beef cattle. For the dairy they are not equal to some other breeds in Scotland. The first improvers of Shorthorns were the brothers Charles and Robert Colling, who commenced improving these cattle nearly a century ago; also Mr. Bates, Mr. Booth, and others, all in the northern counties of England.

OFFSPRING OF IMPORTED CATTLE.

The Departmental circular says:

It is further believed that the imported breeds, when suitably located and managed, produce in their new homes offspring superior to that produced by the same breeds in their original homes, and that the superiority is more marked in their succeeding than in the first generations.

For instance, the imported breeds of Shorthorns, Jerseys, and Holsteins are superior in the United States to the same breeds in Europe; and it is thought that the same result would follow the importation of the Norman, Brittany, Flemish, and Charlevoi breeds, as well as others not enumerated. To what extent is this result realized in other countries?

In answer to this it has to be stated that, as Scotland does not import cattle to any appreciable extent for breeding purposes, little experience can be quoted on the point in question. A few Shorthorns have been imported from the United States which were descended from stock originally sent from this country.

The breeding Shorthorns imported from the United States by Lord Dunmore and other noblemen were of considerably larger size than animals of the same lineage reared in Britain. The ancestors of Shorthorns had been in the United States for several generations and the superiority of their offspring imported to Britain over British-bred stock of the same breed was most marked. This would lead to the inference that cattle grow to a larger size in the United States than in Britain, the more especially as the herds of these noblemen who imported the cattle from the United States contained many of the largest and best-fed animals of the breed in the country.

BEST METHODS OF EXPORTATION TO THE UNITED STATES.

Scotland is well supplied with railroads, and the cattle can be put into special trucks and conveyed quickly to Glasgow, Liverpool, or London, where there are facilities of the best order for shipment, and most suitable and convenient accommodation for animals on board the large Atlantic liners which sail from these ports.

BEST ROUTES OF EXPORT, AND COST THEREOF.

Per rail to Glasgow, Liverpool, or London, thence per suitable or specially fitted up fast steamers to the United States. The "through freight" of cattle from most parts of Scotland to the United States is about \$26 per head: from the extreme northeast of Scotland, Aberdeen, Banff, or Peterhead, about \$27.50.

THE BEST SCOTCH CATTLE TO EXPORT.

The most suitable animals to export to the United States depends on the climatic conditions of the States to which they are sent. A beef producers the Polled Angus, Shorthorns, West Highland, and the Polled Galloway are the best to export from this district. The West Highlander's beef is considered the best, and they are the most hardy, being able to stand much exposure and therefore best adapted for cold and mountainous districts, being able to live on coarse and scanty food. They are, however, small, and do not arrive at maturity till three or four years old. The Polled Angus rank next for superior beef, and are nearly as hardy as the West Highlanders, and are much larger in size and come to maturity at the age of from twenty-eight to thirty-six months. They are principally bred and raised in the northeast of Scotland, and are believed to be very suitable for the northern part of the United States and western ranches. The Shorthorns are very large, and come to maturity at about the same age as Polled Angus, but their beef is of a coarser quality.

The Polled Galloway very much resembles the West Highland, although larger, and comes to maturity earlier. The Aberdeenshire farmers, for beef, prefer a cross between a Shorthorn bull and a Polled Angus cow, as crosses of this origin arrive quickly at maturity, are of good size, and produce beef of fine quality.

As milkers the Ayrshires are undoubtedly the best to take from this country.

PURCHASING PRICES OF ANIMALS.

	Per head	Per ton
Average pure Polled Angus cattle.....	\$50.00	8.00
Black Polled Galloways.....	40.00	10.00
Shorthorns.....	45.00	10.00
Ayrshires.....	75.00	10.00
West Highland.....	75.00	10.00

All, of course, depends on quality.

Very superior specimens of all of the breeds mentioned have repeatedly been sold for exportation to the United States at considerably higher prices than the average given, but to obtain adequate specimens of the several breeds in this district the averages mentioned would have to be given, although sales at less prices have occasionally been made.

For expenses for attendance and food *en route*, \$6.25 for food (hay and oil cake), and \$1.25 per head for attendance—total, \$7.50—is considered sufficient, and with a good number of cattle on board the total expense would be about \$6.25. Some experienced United States traders in thoroughbred cattle are supposed to make \$3.25 cover the total charges under this head.

CATTLE STATISTICS OF SCOTLAND.

The total number of cattle in Scotland for the year 1883 was 1,091,317.

The percentage of the several breeds is not known from any statistics, but probably the cattle stock of this district is composed of three parts of cross-breeds and one part of the several pure breeds.

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The percentage bred for the dairy about 20; for the butcher, about 80 per cent.

Of late years stock in Scotland has decreased. Disease imported from time to time in live stock, causing farmers to cease from breeding cattle, has to a great extent been the cause of this decrease.

Another cause is to be found in the improvement of the cattle, making them ready for the butcher earlier. And a third cause is the increase of population and wages, and consequent enhanced demand for butcher meat, which for many years has been sold for high prices in the Scotch and English markets.

IMPORTS AND EXPORTS OF MEAT AND CATTLE.

The stock of cattle in Scotland is not nearly equal to the consumptive demand.

The stock as shown is not sufficient for home demand, excepting pedigree stock, which is exported to the United States, Canada, Australia, New Zealand, West Indies, and the continent of Europe.

The farmers who in consequence of imported disease have ceased (in a measure), as already mentioned, to breed cattle, mostly get their supplies of feeding-cattle from Ireland, where a good many are bred and not many fattened.

Some cattle from the United States and Canada have also been fattened in Scotland, and there seems to be no reason why this latter trade might not be extended to the advantage of all concerned. But if the Scotch farmers bred and fed cattle to the utmost of their ability the supply of fat cattle would still not be nearly equal to the consumptive demand. The continent of Europe, United States and Canada supply a large proportion of the beef consumed in Scotland and there is every reason to expect that the British demand for beef from these countries will continue to increase.

THE NATURE OF THE IMPORT SUPPLIES.

From the continent of Europe the beef is mostly in its live state; from the United States about half the amount dead and the other half live. A large quantity of tinned or canned meat is also imported from Chicago and elsewhere in the United States. Some cargoes of frozen mutton have come from Australia and New Zealand which appear to have been a success. This trade is likely to increase.

IMPORTS FROM THE UNITED STATES.

A large number of live cattle, fresh meat in refrigerators, and tinned meat come from the United States.

THE BEST MEANS OF INCREASING THE EXPORTS OF AMERICAN MEAT.

If the United States Government would take measures to exterminate pleuro-pneumonia and to suppress any contagious diseases when they appear, the British Government would then admit freely the importation of fat and store cattle, greatly to the advantage of United States producers and of British farmers and consumers. The British owners would profit greatly by having a supply of good store stock from the western plains, and fat stock would fetch a better price if they could be moved from the ports of landing to inland markets.

THE BEST MEANS OF INCREASING THE EXPORTS OF AMERICAN DAIRY PRODUCE

is to send the best articles properly packed, quickly and carefully conveyed, and they will then not only command the highest price in this market but the demand will also increase.

WILLARD B. WELLS,
Consul.

UNITED STATES CONSULATE,
Dundee, February 24, 1884.

Special statistics concerning the products of the several breeds of cattle in Scotland.

Name of breed.	Annual average pounds of milk.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.			Age at maturity.	Weight of meat at maturity.	Color.
				Cow.	Bull.	Ok.			
Improved Polled Angus.	4,000	Lbs. 24	Lbs. 10	1,200	1,750	1,500	3½	1,100	Black.
Shorthorns	4,200	26	10½	1,300	1,875	1,600	3½	1,150	Red, white, roan, and brown.
Ayrshire	6,000	25½	10½	850	1,250	1,050	4	630	Various.
West Highland	2,500	24	10	900	1,350	1,150	5	850	Do.
Polled Galloway	2,500	24	10	1,000	1,500	1,500	5	900	Black.

Name of breed.	Description.	How long bred pure.	Origin of breed.
Improved Polled Angus....	Long, low, deep, wide, even, and cylindrical and pleasing to the eye.	80 years.....	Hugh Watson first improver. His roadsters were Walker, Ferguson and Bowie.
Shorthorns	Formed same as Polled Angus, only larger.	... do.....	Charles and Robert Cuthing, Mr. Booth, and Mr. Bates.
Ayrshire	(See description of Ayrshires in report.)	From time immemorial.	Not known.
West Highland	Shaggy-haired, level and square made.	... do	Native cattle of Scotland.
Polled Galloway	... do	30 years.....	Rev. J. Gillespie, Mouerwald, first improver.

Name of breed.	Methods of housing.	Feeding.	Breeding.	Handling products.
Improved Polled Angus....	Housed in November, December, January, February, March, and April. Pastured during remaining months.	Pasture grass in summer, turnips and straw in winter; occasionally oil-cake added.	From 16 to 24 months	Two men at 4½¢ each per year are required for a herd numbering 120.
Shorthorns	Housed similar to the Polled Angus.	Grass, hay, turnips, and oil-cake.	... do	Do.
Ayrshire	Housed longer than other breeds.	Grass, hay, turnips, and oil-cake; much cooked food in the shape of bran, beans, and meal.	... do	\$7.50 per head per annum.
West Highland	Seldom housed....	Grass in the summer; occasionally straw and turnips in winter.	From 2½ to 3 years.	\$2.50 per head per annum.
Polled Galloway	... do	... do	... do	Do.

AMERICAN DAIRY

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WELLS,
Consul.

cattle in Scotland.

Weight
of meat
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maturity.

Weight of meat at maturity.	Color
1,100	Black.
1,150	Red, white, brown, and brown.
630	Various.
850	Do.
900	Black.

Origin of breed.

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Altitude: In Scotland a high and almost continuous ridge of mountains runs from the NNW. to SSE. To the east of this ridge of high ground the rainfall is comparatively small, and the climates of all districts not exceeding 500 feet above the sea are dry and suited for the successful cultivation of cereals. To the west of the ridge the rainfall is heavy and the climate moist, and therefore only adapted to the rearing of such stock as West Highland or Polled Galloway cattle.

Mean temperature: The mean temperature of January, the coldest month, is 39° in the west and 37° in the east. The mean temperature of July, the warmest month, is about 64°. Wheat and barley are sufficiently ripened, although the mean temperature of July and August falls as low as 56°.

Summer: Summers have been bad in Scotland for the last seven years, generally cold and wet, with much want of sun. The impression current is that the seasons in Scotland are not as good as formerly.

Winter: Generally raw and open in Scotland, but for some years very wet, with much frost.

Soil: All of the four varieties of soil above mentioned as well as others prevail in Scotland. Agricultural survey and surface mapping of this country has been hitherto little studied. Any approximation, therefore, of the relative proportions of the various descriptions of soils would, it is thought, partake largely of the character of conjecture.

Substratum: The underlying rocks in this district are carboniferous, trap, old red, and alluvium.

Cultivated grasses: Clover: For 1883, 1,502,091 acres. Rye-grass, &c.: For 1883, 1,290,032 acres.

SCOTCH BREEDING CATTLE FOR THE UNITED STATES.

REPORT BY CONSUL LEONARD

As a means of obtaining the most reliable information regarding the kinds of Scotch breeding cattle which are likely to be of use to the stock-breeders of the United States, I applied to William MacDonald, esq., editor of the North British Agriculturist, and he has kindly supplied me with much of the material that forms the basis of this report.

Mr. MacDonald published in the North British Agriculturist an editorial on the subject which gives so fully and clearly the information desired as to breeds of cattle peculiar to Scotland that I adopt it as part of my report and give it below without any material addition:

EDITORIAL FROM THE NORTH BRITISH AGRICULTURIST.

It is difficult to answer the queries of the circular definitely or accurately. There is a lack of data, but approximations can and will be given.

At once it may be conceded that with dairying in the forefront there is only one breed native of Scotland which can be a great object to the American. That, of course, is the beautiful Ayrshire, whose milking properties are second to those of no other race when properly developed, and whose fattening qualities, when dry, are astonishing. In the full flow of milk a cow cannot get fat; but when an Ayrshire becomes dry she is not difficult to fatten. This cannot be said with so much force of the rival dairy breeds. An Ayrshire steer is a kindly feeder, and becomes good beef, if well kept throughout, at thirty to thirty-six months, with a live weight of from 1,000 to 1,200 pounds. The breed, however, being in such a pronounced manner a dairy one, the number of pure Ayrshire oxen is not large; nor does the breed claim to rank high as beef-makers, though meat of pretty good quality is easily produced by Ayrshires even after they have served their time at the pail. Records of milking tests with Ayrshires should satisfy Americans that, keeping in view their tendency to lay on flesh when dry, there is no breed preferable to it where dairying is the main object, and few, if any, so good.

The average annual yield of milk per cow of the Ayrshire breed is fully 600 gallons. Of course, some animals produce far more than that, but others are less. The return

of butter per cow annually has been estimated at about 250 pounds, and of cheese rather over 500 pounds.

With the Polled Aberdeen-Angus, the Polled Galloway, and the West Highland breeds there have not been any reliable or exhaustive milking tests. Those breeds are reared chiefly for beef-making purposes; but many animals, especially of the Polled description, are fine milkers. The three breeds excel in respect of the richness of their milk, but comparative analyses on this point are wanting.

The Aberdeen-Angus, taken as a whole, cannot claim to be more than fair milkers. A few cows in almost every large herd, in yield of milk, make a decent approach to an Ayrshire—producing between 500 and 600 gallons per annum. A considerable number, however, notably where the animals have been fed hard, as heifers, would not reach more than half that quantity. In these circumstances, it is doubtful if the average would be quite 400 gallons per cow annually. But when you come to the production of beef this breed stands second to none. Indeed, if early maturity is combined with the quality of the meat, it is probably not too much to say that the Aberdeen-Angus has no equal as a butcher's beast among the pure breeds in this or any country. They "die" remarkably well; that is to say, they accumulate a considerable quantity of fat and tallow internally. Then the wealth and texture of flesh are superb.

The weight at maturity varies a good deal. Picked bulls or oxen fattened hard for exhibition scale occasionally as much as 2,700 pounds, and we have seen females of the breed exceed 2,000 pounds. A good average live weight for cows of the breed, as they go to the butcher, is from 1,200 to 1,400 pounds. Bulls generally range from 1,600 to 1,800 pounds. Oxen not intended for competition in the show-yard, but liberally fed throughout, will go to the butcher at the age of thirty to thirty-six months weighing from 1,500 to 1,700 pounds. The great value of the Aberdeen-Angus as a country like America is its potency in crossing with the rougher native breeds. It lends flesh and quality to the lanky, somewhat sharp-topped, ordinary ranch variety.

The Galloway, like the Northern Polled, is a very old breed. It has not the credit of maturing quite so early as the other polled breed, at least it seldom gets the chance. It is as large in frame as the Aberdeen-Angus, but, as a rule, it is not fattened to such an extent; consequently, the recorded weights are rather less for the Galloway. The dairying properties of the Galloway are not high, though many cows of the breed are really good at the pail, and the quality of the milk is excellent. An American writer recently said that the Galloway beat the Aberdeen-Angus in the production of oxen soup. That may be, but the breed has greater merits than that. It is exceptionally hardy, carries a great quantity of very fine flesh, and is admirably adapted for a wet climate and high exposed country. Galloways have never been so well protected from cold in winter nor quite so generously fed as the Aberdeen-Angus have long been, and are. Galloways are so hardy and so much accustomed to exposure that they should be eminently suited for ranching on the great Western prairies. They cross successfully with other meat-producing breeds; a cross between a Galloway cow and a Shorthorn bull, for instance, has long been a favorite butcher's beast in the border counties, and commands, when well finished, as high prices as the oft-quoted "prime Scot" in the Southern markets. Next to the West Highland, the Galloway breed is probably the hardest in Britain.

The West Highland breed is comparatively unknown in America. A few specimens, however, have lately been sent out, and we hope more will follow. Being hardy, and sometimes nervous, or vicious even, they are not so easily handled as the Polled breeds or as the Shorthorns, but their unrivaled hardiness and rare quality of flesh would be of service on the American ranch. Their beef is of the richest and most palatable nature, and their shapes and character are grand and pronounced. They would, by judicious mating, reduce the "daylight" and tone down the "timber" of the Texan or Western varieties. Many of the Highlanders are never under coat, summer nor winter, and the death-rate is astonishingly small. The West Highland cow will not milk, mature, nor weigh with the Scotch Polled. The milk, however, though short in quantity, is believed to be the richest of its kind in the Kingdom; the beef has the finest of flavors, and is beautifully mixed. They are not usually matured before about four years old, but their ripening properties have not been fully tested. They are fed on more scanty herbage than any other British breed of cattle. If West Highlanders were fed generously from calfhood they would, as a rule, be perfectly ripe at the age of three years, if not before.

SPECIAL STATISTICS CONCERNING SCOTCH BREEDS.

The following information is supplied to assist in properly locating under similar conditions in the United States such foreign animals as

have proved by long experience to have been profitable in their native homes:

Name of breed.	Annual average gallons of milk.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.			Age at maturity.	Weight of meat at maturity.
				Cow.	Bull.	Ox.		
Polled Aberdeen Angus	400	<i>Galls.</i>	<i>Galls.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Yrs.</i>	<i>Lbs.</i>
Polled Galloway	380	.....	.....	1,300	1,700	1,600	2½	900
West Highland	330	.....	.....	1,250	1,650	1,550	3	850
Ayrshire	600	2½	1½	1,050	1,400	1,250	4	720
				900	1,150	1,050	3	620

Name of breed.	Color.	Description.	How long bred pure.	Origin of breed.
Polled Aberdeen Angus	Black	Long deep body on short legs; the finest of beef; rich flesh on small bone; glossy coat; best of beef producers, and fairly hardy.	Nearly a century.	The old Scotch cattle.
Polled Galloway	do	Long haired, deep framed, wealthy fleshed, strong bone, very hardy, suitable for wintering outside.	Over a century.	Scotch races.
West Highland	Black, red, dun, yellow, brindled.	Long horns, long hair, short legs, deep ribs, good outline, somewhat narrow frame, great length, hardiest British breed, winter outside.	Time immemorial.	Obscure.
Ayrshire	Black and white, red and white, brindled.	Short upstanding horns, sharp hind quarters, broad ribs, smooth skin; best dairy breed in Scotland, if not in Great Britain.	For generations.	Uncertain.

Name of breed.	Product.			
	Labor.	Meat.	Milk.	Cheese.
Polled Aberdeen Angus	Good	The finest grained	Rich	Fair
Polled Galloway	Fair	Excellent rich flavor	Good quality	Good quality
West Highland	Untractable	Finest flavor	Rich but small	Fine
Ayrshire	Scarcely used	Fair quality	Great in quantity and of fair quality	Good

Note.—Animals fattened hard from youth for exhibition of the Polled and West Highland breeds arrive earlier at maturity than is indicated above, and at on greater weights, but the estimates given are for the average. Cows fed on corn and other special food will give larger returns in milk, but this is not the case in the above.

In supplement to the foregoing tabular matter, I subjoin further information relative to the Polled Galloway and Ayrshire cattle which, may be deemed of interest.

CHARACTERISTICS OF A TYPICAL GALLOWAY.

I quote from a pamphlet published by the Rev. John Gillespie, M. A., editor of the Galloway Herd-Book of Great Britain (to whom I am indebted for other information contained in this report), as follows:

Statement of the characteristics of a typical animal of the Galloway breed.

Proven by the Committee of the Galloway Herd-Book of Great Britain, 18th April, 1883.

Color.—Black, with a brownish tinge.
Head.—Small and wide, with broad forehead and wide nostrils; without the slightest symptoms of horns or scurs.

Eye: Large and prominent.

Ear: Moderate in length and broad, pointing forwards and upwards, with fringe of long hairs.

Neck: Moderate in length, clean, and filling well into the shoulders; the top in a line with the back in a female, and in a male naturally rising with age.

Body.—Deep, rounded, and symmetrical. *Shoulders*: Fine and straight, moderately wide above; coarse shoulder points and sharp or high shoulders are objectionable. *Breast*: Full and deep. *Back and rump*: Straight. *Ribs*: Deep and well sprung. *Loin and sirloin*: Well filled. *Hook bones*: Not prominent. *Hind quarters*: Long, moderately wide, and well filled. *Flank*: Deep and full. *Thighs*: Broad, straight, and well let down to hock; rounded buttocks are very objectionable. *Legs*: Short and clean, with fine bone. *Tail*: Well set on and moderately thick. *Skin*: Mellow and moderately thick.

Hair: Soft and wavy, with mossy undercoat; wiry or curly hair is very objectionable.

CHARACTERISTIC POINTS OF AYRSHIRE CATTLE.

The second article is quoted from the report of a committee of the Ayrshire Agricultural Society appointed to revise the points indicating excellence in the Ayrshire breed of cattle, as follows:

Proposed ratio scale of points of excellence in Ayrshire cattle.

	Points.
(1) Head short, forehead wide, nose fine between the muzzle and eyes, muzzle large, eyes full and lively, horns wide set on, inclining upwards.....	10
(2) Neck moderately long, and straight from the head to the top of the shoulder, free from loose skin on the under side, fine at its junction with the head, and enlarging symmetrically towards the shoulders.....	5
(3) Fore quarters: Shoulders sloping, withers fine, chest sufficiently broad and deep to insure constitution, brisket and whole fore quarters light, the cow gradually increasing in depth and width backwards.....	5
(4) Back short and straight, spine well defined, especially at the shoulders, short ribs arched, the body deep at the flanks.....	10
(5) Hind quarters long, broad, and straight; hook bones wide apart, and not overlaid with fat; thighs deep and broad; tail long, slender, and set on level with the back.....	9
(6) Udder capacious and not fleshy, hinder part broad and firmly attached to the body, the sole nearly level and extending well forward, milk veins about udder and abdomen well developed. The teats from 2 to 2½ inches in length, equal in thickness, the thickness being in proportion to the length, hanging perpendicularly; their distance apart at the sides should be equal to about one-third of the length of the vessel, and across to about one-half of the breadth.....	33
(7) Legs short in proportion to size, the bones fine, the joints firm.....	3
(8) Skin soft and elastic, and covered with soft, close, woolly hair.....	5
(9) Color red, of any shade, brown or white, or a mixture of these, each color being distinctly defined. Brindle or black and white is not in favor....	3
(10) Average live weight, in full milk, about 10½ cwt.....	8
(11) General appearance, including style and movement.....	10
Perfection.....	100

JOHN LORNE STEWART (OF COLLA)
Convener of Committee.

At the annual general meeting of 19th February, 1884, the above report was adopted, and ordered to be printed and circulated amongst the members and others.

JAMES McMURTRIE,
Secretary.

METHODS OF HOUSING SCOTCH CATTLE.

Polled Aberdeen Angus.—Grazing in summer. Stalls or partially covered courts in winter.

Polled Galloway.—Grazing in summer. Wintered mostly in open air, and partially in court-yards.

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West Highland.—Outside through summer and winter. Supplied with hay and some turnips during severe snow storm or frost.

Ayrshire.—Grazing in summer. Kept mostly in byres during winter, with runs out in open weather.

FEEDING SCOTCH CATTLE.

There is very little cake or purchased food fed to any of the breeds, excepting for animals intended for exhibition, or during the last few months of preparation for the butcher.

Rather more extra feeding is supplied to the Aberdeen Angus than to the other breeds, especially in the case of high-bred pedigree stocks.

BREEDING SCOTCH CATTLE.

In the select pedigree herd bulls are kept in the house, and the females are brought to them at the discretion of the owners, having scrupulous regard to the relationship and corresponding features of the animals.

In general commercial stocks, or breeding for the butcher, it is quite common in the case of Galloway, Highland, or Ayrshire cattle, to allow a bull to graze regularly in a park with twenty to thirty females.

HANDLING PRODUCTS.

As regards dairy produce, that obtained from the Galloways and Ayrshires is largely made into cheese, the remainder being chiefly disposed of in sweet milk to the large towns by rail and milk-carts.

The Polled Angus and Highland in most cases foster their own calves and supply milk for the necessities of the various holdings.

A great many of the Ayrshire cows' calves are sent at once to the butcher, while others are fattened at the age of a month or two as veal, but the calves of the other three breeds are, as a rule, brought to maturity at the various ages indicated in the foregoing table.

TOPOGRAPHY OF SCOTLAND.

With reference to the questions of altitude and temperature indicated on the schedule accompanying the cattle circular, I may briefly state that Scotland has been aptly defined as "a great plateau, deeply cut into valleys and having mountains rising to 2,000 or 3,000, and occasionally even 4,000, feet of elevation." The climate is exceedingly variable. From its insular position, however, the cold in winter is not so intense nor the heat in summer so great as in corresponding latitudes in the United States or on the continent of Europe.

The temperature, except in moorlands in the interior and the more mountainous districts, seldom remains long at the freezing point, nor in any part of the country does it often rise to an intensity incommensurate with the labor of the field. The ordinary greatest range of the thermometer is between 84° and 8°.

While the average temperature generally may be held to range between 45° and 47°, it is noteworthy that it does not descend as the observer moves northward, or to the vicinity or into the interior of the Highlands.

The mean temperature of Scotland, noted at fifty-five stations, altitude 256 feet, during the year 1883, was 45° 9', and the mean temperature of the city of Edinburgh, with an altitude of 260 feet, for the same period, was 46° 9'.

As to the proportions in which the various soils are distributed throughout Scotland, I find it stated in a work of reference which, although published some years ago, is still valuable in many respects as an authority, that—

The loams amount to	1,800,171
Rich clays.....	987,727
Gravelly soils.....	981,827
Cord or inferior clays	510,271
Improved mossy soils	411,371
Alluvial bough or coarse land.....	320,171
Sandy soils.....	200,171
Total cultivated land, probably	5,903,171
Total uncultivated land.....	13,900,327
Total area.....	19,803,498

or 29,600 square miles. Of this area about 4,000 square miles belong to the islands.

According to the agricultural returns recently published, I find that the cultivated area of Scotland is now estimated to be about 4,800,000 acres.

Regarding the questions of soil and substratum and their conjoint relation to the cattle and the natural feeding products of a district, I would take the district of Aberdeenshire and Banffshire as the best type in Scotland. The cattle from that part of Scotland command the highest price in the London markets, partly due to the breed and partly to the natural feeding facilities possessed. More than one-half of the area is occupied by granite, generally in a decomposed state. This decomposed granite, being rich in alkalis (potash and soda), from the decomposition of the feldspars and mica, forms a soil to which only a proportion of phosphate requires to be added as an artificial manure to raise the best turnip crop in Scotland. The high feeding powers of these turnips, along with the natural clover that grows freely all over the shire, enable the Aberdeenshire farmers to turn out the best fed cattle in the market.

EXPORT AND PRICES OF SCOTCH CATTLE.

In reply to the memoranda accompanying cattle circular I have to state as follows:

The best method of exportation to the United States is by regular cattle-carrying steamers.

The best animals to export are Polled Angus, Polled Galloway, Scotch horns, and Herefords.

The best routes of export and cost thereof are from London, Liverpool, and Glasgow, on an average of \$17 to \$24.

The purchasing prices of the animals are, for good class yearlings Polled Aberdeen or Angus, £30 (\$146) to £50 (\$213.33). But individual specimens of the choicer pedigreed Aberdeen or Angus have reached over 500 guineas (\$2,554.91). Galloways, £25 (\$121.66) to £40 (\$194.44), while choicer pedigreed specimens of the Galloway breed have fetched long prices. West Highland, £15 (\$73) to £20 (\$97.33). Ayrshire, £20 (\$97.33) to £25 (\$121.66).

The estimated expense for attendance and food *en route* is about £1 (\$4.86) a head, if ten or more go.

DISTRIBUTION OF SCOTCH CATTLE.

Throughout Scotland Shorthorns are more generally distributed than any of the four distinct breeds peculiar to the country, but these four

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cover the ground they belong to more closely. The Galloways and Ayrshires may be said to completely cover the southwest of Scotland from Stirling and Dumbarton to Ayrton. The West Highland cattle occupy the northwestern counties, and the Polled Aberdeen Angus with Short-horns, the northeastern counties. Shorthorns are more numerous in the northeastern counties (in the Polled Aberdeen district) and they extend to the southeast in counties.

BREEDING FOR DAIRY AND

About 15 per cent. of the cattle in Scotland are bred for the dairy and about 85 per cent. for the butcher.

NUMBER OF CATTLE IN SCOTLAND.

With respect to increase or decrease of stock in this country, I may state that according to the board of trade returns, collected on 5th June, 1883, the number of cattle of all ages in Scotland was 1,094,317. This is a slight increase on the figures for 1882, but less than the number returned for 1872, as thus shown:

1872	1,120,500
1878	1,095,387
1882	1,094,216
1883	1,094,317

Nevertheless, there was a slight increase during same time in England and Wales, making the total for Great Britain rather more in 1883 than in 1872.

IMPORTS OF CATTLE INTO GREAT BRITAIN.

England and Scotland are largely dependent on foreign supplies of cattle. The needed supplies are obtained thus:

From the United States: Large numbers weekly of fat cattle, generally of the best quality. These have to be slaughtered at the port of debarkation; also a very large quantity of killed meat.

From Ireland: Heavy weekly supplies of fat, and, in the season, large numbers of store cattle.

Spain and Portugal: About 25,000 to 30,000 head of good class fat cattle weekly.

The northern countries of Europe: Gross number about 5,000 cattle weekly.

Russia: A considerable and increasing trade in dead meat.

Canada: Gross number about 60,000 cattle, of which probably 10,000 to 15,000 bought by farmers to feed.

PORTRAITS OF REPRESENTATIVE SCOTCH CATTLE.

In accordance with requirement expressed in the memoranda above referred to, I have secured portraits of representative cattle of the several breeds, and send them herewith. The list of portraits is as follows:

POLLED ABERDEEN OR ANGUS (by favor of George J. Walker, esq., Portlethen, Aberdeen).

1. Bull. Sir Maurice (1319).

2. Cow. Jimo (3574).

3. Cow. Sybil, second of Tillyfour (3,26) and her heifer calf Suppha Sybil.

POLLED GALLOWAY (by favor of Rev. John Gillespie, M. D., Mouswald, Dumfriesshire).



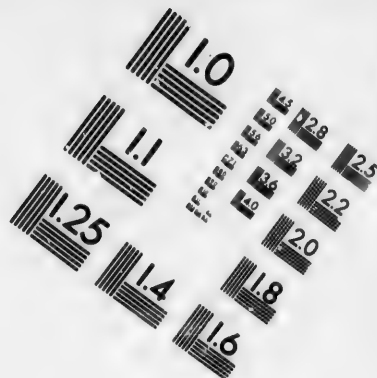
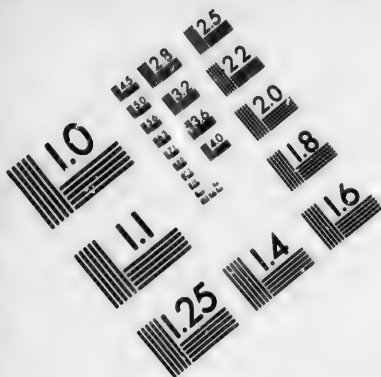
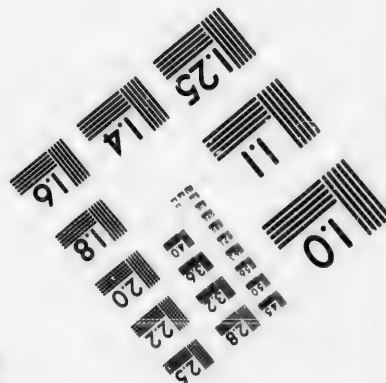
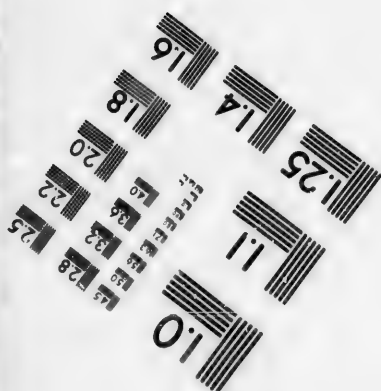
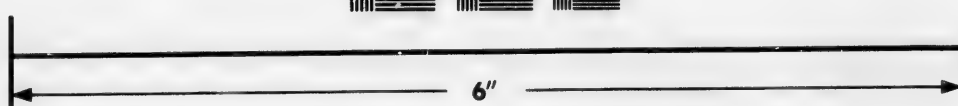
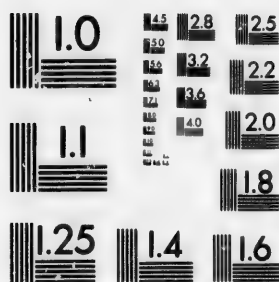


IMAGE EVALUATION TEST TARGET (MT-3)



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- (4) Bull. Harden (1151), from oil painting by Gouday Steel, animal painter to the Highland and Agricultural Society).
 (5) Cow. Clara (1375).
 (6) Heifer. Lalla Rookh (2142).
 WEST HIGHLAND (by favor of John Robertson, esq., Old Blair, Bleir Athole):
 (7) Bull. Photographed from one of the Duke of Athole's herd.
 (8) Cow. Photographed from one of the Duke of Athole's herd.
 AYRSHIRE (by favor of James McMurtrie, esq., Ayr.):
 (9)* Bull. Baron O'Bucklyre (281) at four years.
 (10)* Cow. Bright Smile (1307) at four years.

Those portraits are not uniform and do not indicate the size of each animal relatively to the others, but I believe the relative size of each animal can be estimated by reference to the tabular matter in this report.

Besides the gentlemen whom I have named as having aided me with materials for this report, I am indebted for much of the information contained in it to Messrs. John Swan & Sons, the eminent cattle agents of Edinburgh and Glasgow.

J. A. LEONARD,
Consul-General (lately Consul at Leith).

UNITED STATES CONSULATE-GENERAL,
Calcutta, July 18, 1884.

CATTLE IN IRELAND.

REPORT BY CONSUL PIATT, OF QUEENSTOWN.

RAVAGES OF THE FOOT AND MOUTH DISEASE.

Since receiving cattle circular many letters of inquiry addressed to persons presumed to have the best and fullest knowledge upon the subject of breeding cattle in my district have been written, the answers to which have been few and far between as well as meager. The following statement is made up of information thus received supplemented by personal inquiries which I have caused to be made:

During the past year several districts in Ireland have suffered very severely, owing to the introduction of foot and mouth disease from England. With a view to checking its spread and ultimately "stamping out" the disease, very stringent restrictions were placed upon the cattle trade of the entire island by the veterinary department of the privy council. Fairs and markets were prohibited in many parts of Ireland, and several of the most important shipping ports were closed against exporters. In order to secure open ports in England and Scotland for Irish cattle it became necessary to have cordons drawn around the uninfected districts in Ireland, and no cattle were permitted to be shipped from districts outside those embraced by these cordons. Even cattle inside the cordons could only be shipped on the production of a certificate from the clerks of the poor-law unions, who had means at hand for satisfying themselves that no infected cattle were permitted to leave Irish ports. By this arrangement, and owing to these very crushing restrictions, the important stock-breeding province of Connaught was for a time completely suppressed, all sales of cattle being prohibited except by special license of the lord lieutenant, or else by means of an application to the clerk of the local authority or a justice of the peace.

* For portraits of Ayrshire cattle see report of Consul Wells, of Dundee.

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GALLOWAY BULL "HARDEN" (1151)

Julius Ross & Co. Lith



GALLOWAY COW "CLARA"



James Fennell sculp.

GALLOWAY COW "CLARA"



GALLOWAY HEIFER "LALLA ROOKH"

Photo from N. S. Ellis



WEST HIGHLAND BULL

Julius Benck & Co. Ltd.



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No order like this has ever before been issued in Ireland, and the effect of the mandate upon small stock-breeders must prove almost ruinous. Some idea of the disastrous effect of these restrictions upon the cattle trade of the entire country may be gathered from the fact that it is in this same province of Connaught that the largest and most important cattle fair held in Ireland takes place. The fair referred to is that annually held in Ballinasloe, and which is always attended by large numbers of stock breeders from the other three provinces, viz. Munster, Leinster, and Ulster, in search of young stock for fattening purposes. The stopping of the source from which these young stock were obtained cannot but have a very damaging effect on the entire cattle trade of the country.

THE CATTLE TRADE OF IRELAND.

The cattle trade of Ireland is undoubtedly its greatest and most flourishing industry, surpassing as it does by several millions of pounds sterling annually the very important and prosperous linen trade of the northern province (Ulster). For several years past Irish stock-breeders have been receiving from England and Scotland in exchange for live stock an annual average of \$73,000,000. The returns for the year just closed have not yet been made out, but it is anticipated that they will prove the most depressing on record, and on a rough estimate the sum realized it is not expected will exceed £8,000,000 or £10,000,000. In the year 1882 there were exported from Ireland to Great Britain 291,777 fat cattle, 430,000 "stores" (lean cattle), and of other descriptions 3,000, or a total of 724,777. During 1883 not more than half this number have been exported, owing to the restrictions above referred to. For four out of the twelve months the export of "store" cattle from Ireland to England was prohibited altogether, and for seven months of the year the restrictions of a general character were so great as to almost extinguish the cattle trade in some portions of the island. The precautions adopted by the veterinary department, however, are having the desired effect; the spread of the disease has been checked, and its ravages have now been "stamped out" of some districts. In proportion as these good results are being realized the restrictions are being removed; but, though a considerable improvement has taken place, the cattle trade of the country is still very much crippled, and it will take some time before it recovers the serious check which it has sustained.

In connection with this part of the subject it will be of interest to draw a comparison between the prices which cattle brought in 1872 and 1883 at Ballinasloe fair. In 1872 first-class oxen (mixed breeds) realized £24 10s. (\$119.22) per head. In 1875 the same class brought £25 10s. (\$124.09) per head, while last year these quotations fell to £20 10s. (\$99.76), and as low as £13 (\$63.26) per head for fourth-class animals. In 1872 first-class heifers sold at £20 (\$97.33), and last year they brought £22 (\$107.06); the quotations for fourth-class animals being £14 (\$68.13).

CATTLE CENSUS OF IRELAND.

The total number of cattle of all classes and breeds in Ireland in 1883 was 4,096,021, an increase of 108,810 over 1882. Of this number there were in Leinster 1,066,502, increase 35,330; in Ulster 1,078,049, increase 24,221; in Connaught 623,997, increase 10,815; and in Munster 1,327,473, increase 38,444.

The table which I inclose will show the number and description of cattle in each county of Munster (in which province this consulate has

its jurisdiction) during the years 1882 and 1883. Of the different breeds comprised in this return it is impossible to give the proportions, though cattle of mixed breeds largely predominate.

GENERAL INFORMATION CONCERNING CATTLE IN IRELAND.

I return herewith the printed form which accompanied circular of July 18, 1883, with the blanks filled so far as I have been able to obtain the requisite data. Dr. William K. Sullivan, president of the Queen's College, Cork, who is considered the first authority on the subject of inquiry in Southern Ireland, and to whom I am indebted for the principal topographical and scientific facts (including the list of grasses), remarks in sending the same to me:

Our farmers are so little accustomed to such numerical and accurate details that I assure you it is very difficult to give such information. The details about the breeds of cattle have been given by Mr. James Byrne, J. P., Wattstown Castle, Shanballymore, County Cork, one of the most experienced agriculturists in the county, and one too who had the advantage of scientific training. The information about the geology could, as you will at once see, be only general, and I have accordingly written it across the columns.

Mr. Richard J. Maxwell Gumbleton, J. P., Glanatore, Tallow, County Waterford, a successful breeder and exporter of Shorthorns in Southern Ireland, has been kind enough to furnish some expressions of opinion as well as information on various points referred to in your instructions. Mr. Gumbleton states that the best method of exporting cattle from the south of Ireland to the United States is by shipping them from the ports of Cork or Waterford via Liverpool to any port of our country. There are, he says, very valuable herds of Shorthorns in Ireland, and the bulls from these herds he has no doubt would pay well for exportation to the United States. The only other breed peculiarly good, Mr. Gumbleton says, are the Kerry cattle, which are very pretty (small in size and black) and very good milkers. The Shorthorns in Ireland are altogether bred for dairy purposes, the mixed breeds being reserved more for the butcher. Latterly the breeding of stock in the south of Ireland is on the increase, and the supply is very much in excess of the home demand; in fact the stock-breeders of Ireland live by exporting vast numbers of cattle every year to England and Scotland. It would, therefore, in Mr. Gumbleton's opinion, be highly undesirable to export cattle from the United States to Ireland for dairy uses or for the purpose of the butcher; in fact, sending cattle to Ireland would be somewhat like "sending coals to Newcastle." His experience is that cattle, as a rule, if circumstances be favorable, greatly improve by exportation, and he would willingly use an American-bred bull, if well bred, and think the fact of his coming from America a good recommendation. He doubts if the imported Shorthorns in the United States are superior to the best herds in England and Ireland, and he strongly suspects there are a greater number of first-class Shorthorns in England and Ireland than there are in the United States. He believes, however, that most breeders would be glad to have a change of blood, provided the animals were well-bred, and he considers such a change would be attended with satisfactory results to all concerned.

Mr. Richard Wood, Aherlow, County Cork, an extensive and successful cattle breeder and exporter, has in reply to questions given the following information in connection with the cattle trade:

The best animals to export to the United States are Shorthorns, and Pedigree Shorthorns can be had as low as £40, and as high as £1,000, or more, each. Kerry cattle are also very good, and these are attracting more attention than they did formerly,

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owing to the ease with which they are managed. They are particularly suited to mountainous districts, which would not properly feed Shorthorns. Good Kerrys can be had for £20 each. The best means of exporting cattle from the south of Ireland would be via the ports of Cork or Waterford to Liverpool, and thence by the steamers of the National Line to the United States. The steamers of the National Line being the largest and steadiest, are best adapted for the purpose. As to fodder, hay, oats, bran, and some cake would form very good food for the vo age. The supply of cattle in the south of Ireland is very much in excess of the home demand, and the surplus stock are exported to the midland counties of England and Scotland.

The rate for transportation of cattle from Cork to Liverpool, by local steamers, is about \$2.60 per head, insurance extra.

It may prove interesting to note that the total acreage of the province of Munster is 5,934,682, which during the years 1882 and 1883 was utilized as indicated in the inclosed statement.

JOHN J. PIATT,
Consul.

UNITED STATES CONSULATE,
Queenstown, April 3, 1884.

Return showing the number and description of cattle in each county in the province of Munster during the years 1882 and 1883.

Counties.	Milch cows.	Two years old and upwards.	One year old and under two years.	Under one year.	Total.
Cork:					
1882	177,621	41,278	63,076	101,309	383,284
1883	175,800	38,601	66,151	109,845	390,397
Kerry:					
1882	103,519	21,725	29,440	51,511	206,295
1883	101,851	20,759	28,891	56,574	208,075
Clare:					
1882	51,604	33,805	34,180	36,564	156,153
1883	54,632	28,634	37,257	44,136	164,659
Limerick:					
1882	96,315	24,484	23,187	59,854	203,840
1883	95,855	23,389	25,566	60,234	211,044
Tipperary:					
1882	81,080	51,100	49,543	60,886	242,708
1883	89,076	52,504	55,748	63,857	255,185
Waterford:					
1882	41,686	13,682	18,701	22,771	96,840
1883	40,958	13,579	19,990	24,246	98,773
Total:					
1882	554,825	186,173	218,136	332,895	1,292,029
1883	551,572	177,466	233,603	364,832	1,327,473
Increase in 1883			15,467	31,937	38,444
Decrease in 1883	253	8,707			

Breeds of cattle in the south of Ireland.

Name of breed.	Annual average pounds of milk.	Milk to pounds of butter.	Height at maturity.			Live weight.		
			Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
Shorthorn	9,450	Lbs. 38	In. 56	In. 60	In. 64	Cwt. 9 to 11	Cwt. 15 to 23	Cwt. 12 to 20
Kerry	4,000 to 5,000	48	50	52	54	4	5	3
Dexter	3,000 to 4,000	50	52	54	56	5	6	7
Limerick Dairy	8,000 to 9,500	54	58	62	66	9	12	15

Breeds of cattle in the south of Ireland—Continued.

Name of breed.	Age at maturity.	Weight of meat at maturity.	Color.	Description.	How long bred pure.	Origin of breed.
Shorthorn	Yrs. 5	Cwt. 6 to 9	Red and roan.	This is well known	100 years	Imported from Yorkshire and Durham.
Kerry	5	4	Black ...	Small hardy mountain breed.	Time immemorial.	Aboriginal.
Dexter	5	5	Red	Small breed; good for fattening; not so milky as Kerry.	100 years	Cross between Kerry and Devon; originated by a man named Dexter.
Limerick Dairy	5	7	Red and roan.	Middle-sized; horns longer than those of the Shorthorns; good milkers.	Time immemorial.	Cross between Shorthorn and ancient dairy breed of the district.

Mean temperature.—Cork, 51.5° Fahr.; Limerick, 49.4°; Waterford, 48.6°. The mean temperature of the southern half of Ireland varies from about 48° in the interior to 52° on the southwest seashore.

Substratum.—The mountains in the south of Ireland are all Silurian and Devonian slates and sandstones. The plain of Munster, which comprises the great cattle districts of Limerick, Tipperary, and North Cork, is mountain limestone. Most of the river valleys also contain mountain limestone. In many parts of the country the underlying rock is covered with deposits of gravel and sand; clay, called by Irish geologists "drift," resulting in part from ice action. These gravels correspond in great measure to the subjacent rock, that is, are "limestone gravels" in the limestone districts, and sandstone and slate gravels, clays, and sands in the Silurian and Devonian districts.

Cultivated grasses.—The following are the kinds of grasses sown in laying down land for permanent pasture: *Poa trivialis*, roughis, meadow grass; *Poa pratensis*, smooth-stalked meadow grass; *Festuca duriuscula*, or hard fescue, a variety of *Festuca ovina*, sheep's fescue; *Dactylis glomerata*, rough cocksfoot grass; *Solum perenne*, perennial rye-grass; *Anthoxanthum odoratum*, sweet-scented vernal grass; *Cynosurus cristata*, crested dog's-tail grass; *Alopecurus pratensis*, meadow fox-tail grass; *Phleum pratense*, common cat's-tail grass; *Avena flavescens*, yellow oat; *Festuca loliacea*, a variety of *Festuca pratensis*, meadow fescue.

[Common red clover and Italian rye are grown for hay, but are cut for soiling in early spring. White clover is generally sown with the grass seeds for permanent pasture.]

Total acreage of Munster and utilization of same during the years 1882 and 1883.

Year.	Total extent under crops, including meadow and clover.	Grass.	Fallow.	Woods and plantations.	Bog and marsh and barren mountain land, water, roads, fences, &c.	Total acreage.
1882.....	1,246,394	3,248,167	4,578	111,815	1,324,128	5,331,622
1883.....	1,212,170	3,283,458	4,120	116,991	1,323,913	
Increase in 1883.....		35,291				
Decrease in 1883.....	34,224		458	424	185	

BUTTER INDUSTRY OF IRELAND.

REPORT BY CONSUL PIATT, OF CORK.

In my report on the credit and trade system in the south of Ireland published in No. 43 of Consular Reports, I mentioned the butter trade as the principal one identified with Cork.

It has more than once, since I forwarded that report, occurred to me that a special report on the butter industry and trade in Southern Ireland would not only be interesting to our people at large, but might afford some suggestions whereby our many countrymen interested in dairy farming, as well as those dealing in dairy products, would be benefited.

Accordingly, as giving full information regarding the butter industry in Ireland, and especially in the south of Ireland, as well as discussing the relative condition of this local industry as compared with the same industry in other countries, stating the drawbacks under which it labors, and suggesting the proper steps to be taken for their removal and for the improvement of this staple industry of Southern Ireland, I inclose a copy of the evidence given last June, before a special committee of the British House of Commons, by William J. Lane, esq., of Cork.

Mr. Lane has contributed directly to one or two reports which I have heretofore made on trade between the United States and Ireland, &c. He is a gentleman of great intelligence and enterprise, himself a butter merchant of large experience, one of the principal promoters of the Cork Exhibition of 1883, and likely to be widely known henceforth in the politics of Southern Ireland, being one of the newly chosen members of Parliament of the Nationalist party from the county of Cork. To Mr. Lane's statement, which relates to, illustrates, and discusses the dairy and butter industry at large, I add a report on the butter trade of Cork, explaining the advantages of the climate and soil in Munster for the production of butter, presenting various interesting statistics in connection with the local butter manufacture and trade, describing the customs and methods of the Cork Butter Exchange, giving the price of butter for a long series of years, &c., specially prepared and furnished for my use by T. J. Clanchy, esq., another prominent butter merchant of the city, who is mentioned in Mr. Lane's statement, and who is particularly identified with the trade in canned butter. Mr. Clanchy has obtained gold and other medals at the Paris, Calcutta, and Melbourne Exhibitions, during recent years, over all competitors, for his hermetically sealed canned butter, and contributed to the consular exhibit from this district last year at New Orleans a full display of his goods, which I think must have attracted the attention of such visitors as were interested in the dairy products of the United States.

In connection with the subject of canned butter, it may be well to direct the attention of those in our country so interested to the opportunity which, I am told, exists for a large development of American enterprise with respect to this class of butter.

Within seven or eight years France, Germany, and Denmark have, by the adoption of the system of packing butter in hermetically sealed cans, each containing 1, 2, 3, 7, 11, or 24 pounds of butter, secured the entire, or about the entire, trade of supplying the ships of the world. I believe that the American creamery butter is eminently suitable for this particular branch of the export butter trade. If this butter were packed

Origin of breed.

Imported from
Yorkshire and
Durham.
Aboriginal.

Cross between Ker-
ry and Devon,
originated by a
man named Dex-
ter.

Cross between
Shorthorn and
ancient dairy
breed of the dis-
trict.

rd, 48.6°. The mean
in the interior to 52°.

Irish and Devonian
the great cattle dis-
sestone. Most of the
the country the un-
called by Irish geolo-
correspond in great
in the limestone dis-
Irish and Devonian

in laying down land
Poa pratensis, smooth-
ty of Festuca ovina,
in perenne, perennial
Cynosurus cristata,
grass; Phleum pra-
estuea loliacea, a va-

are cut for soiling in
seeds for permanent

ars 1882 and 1883.

	Bog and marsh and barren mountain land, water, roads, fences, &c.	Total acre- age.
5	1,324,128	5,934,662
1	1,323,943	
4	189	

and sealed in cans similar to those exhibited by Mr. Clanchy, which preserve the butter fresh and sweet for a long period in any climate, immediately on being made at the creameries, nothing, so far as I can see, is to prevent its use in supplying the immense foreign shipping trade of our country.

Whereas all vessels going from Europe to America take with them a supply for the double voyage, it would be quite practicable, if this enterprise were introduced in the United States, to secure the entire business for American exporters. In my opinion our countrymen would be able to compete most successfully with European countries for this trade, inasmuch as all dairy products can be raised so much cheaper in the United States than at this side of the Atlantic.

For the large passenger steamships the finest butter is utilized, and also for export to countries where the consuming population require, and can afford to pay for it, such as India, Japan, China, Australia, the South American countries, and those bordering upon the Mediterranean.

For merchant shipping, and for the lower or poorer classes of the population in the above-named countries, a second and third quality of butter is good enough, and it is for the inferior qualities the United States, it would appear from the published market reports, require a greater outlet than for the products of the best dairies, inasmuch as the American markets are constantly glutted with unsalable surplus stock of lower grade butter, chiefly owing to the inroads which the improved manufacture of butterine has made upon the markets hitherto available for the consumption of cheap genuine butter. Since merchant vessels use chiefly butter of the third quality, it will be seen that a market for large quantities of this class of butter might be found if the canning system were adopted for the supply now furnished for the most part by European exporters.

Within a few years past two Irish houses have adopted this system of tinning butter, and their efforts have been crowned with great success, although their combined shipments are so small that it does not contradict my general statement that France, Germany, and Denmark monopolize the trade. The two Irish houses referred to are those of Messrs. Clear and Sons, and Mr. Clanchy, who furnishes the accompanying interesting report. The latter shipper, at much trouble and expense gave his fellow-tradesmen in the United States an opportunity of inspecting for themselves the way in which the tinned butter trade in Ireland is worked, by the exhibit at New Orleans already mentioned.

In my report on the credit and trade system, I explained the method by which transactions are regulated between the producers and the butter brokers in Cork market.

It may be worth while to quote that portion of said report; it is as follows:

In the beginning of the year the butter brokers of Cork market advance loans to the farmers to the amount of two-thirds of the value of their butter produce for the year, at rates of interest varying from 6 to 10 per cent. With this money the farmer pays his rent, buys stock and seeds; according as he makes his butter he sends it to the broker to pay off his debt.

The brokers borrow the money so advanced from local banks, at a lesser rate of interest than they charge. When they receive the butter from the farmers they sell it to the exporters for prompt cash, and the exporters ship to English merchants, giving one and two months' credit for the payment.

The export of butter is a different branch of the trade conducted by a different set of merchants, who, on receiving their orders from their

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foreign correspondents, go to the Cork Butter Exchange daily and buy the brands they require at the open competition which takes place, as explained by Mr. Clanchy, at 11 a. m. each day; and they resell to their customers at a fixed regulation commission of 2s. 6d. (or 60 cents) per hundred-weight over the published Cork market price of that date. This commission includes buying, selecting, carting, coopering, and shipping. Out of this commission they allow buyers a discount of two months at 5 per cent. (*i. e.*, 2d. per pound sterling, or 4 cents per \$4.87) for prompt cash payments, or they draw a bill on the purchaser at two months after date for the net amount of the invoice. Unlike the American shippers they give the butter to the buyer before they receive either cash or bill, and frequently they have to regret this system of trading, as their customers often become bankrupts and completely evade payment for the goods purchased. Having observed the system here and in the United States, I am inclined to believe that the latter is the better and safer, since it requires the drafts to be paid by the consignees before they obtain possession of the bills of lading, and consequently before they get possession of the goods.

JOHN J. PLATT,
Consul.

UNITED STATES CONSULATE,
Cork, October 29, 1885.

THE BUTTER TRADE OF CORK.*

The staple product of the South of Ireland is butter. The province of Munster, of which Cork is the chief city, is essentially and before all other things a butter-producing country, for which it possesses a remarkable combination of natural advantages not to be found together elsewhere. The essential conditions for making good butter, are: (1) A mild, equable climate, not too hot in summer and not too cold in winter. (2) A sufficient rainfall to promote an abundant growth of grass. (3) A good firm soil, not over-rich. Fine butter cannot be made in an excessively hot climate, and of course snow and frost, that cover and bind up the pastures for a considerable part of the year, render its production in quantity impossible.

Grass-fed butter will always be the best, and the country where the cattle can be fully grass-fed in the open air for the longest period of the year is that in which most butter of good quality can be produced.

The climate of Munster is rendered singularly even in its temperature by its geographical position. Its coast line extends over nearly the whole southern end and a large portion of the western side of the island, receiving the first influence of the great warm ocean current, the Gulf Stream, which acts as an equalizer of temperature, a sort of governor, preventing the winter from being too cold and the summer from being too hot. The warm vapors floating over the land in winter raise the temperature, and by forming clouds and rain in the summer prevent excessive heat.

The winters are much milder than in other countries of the same latitude. Occasionally a winter passes without sufficient ice to give even one day's skating.

The rainfall is very great, and combined with the mildness of the seasons causes an abundant growth of grass for a large part of the year. A great proportion of the pastures are on undulating uplands, the configuration of which lends itself to rapid irrigation, the water running off the slope and leaving the grounds sufficiently moist without morass or sponginess.

The pastures in those upland districts are not over-rich, but good, sound, friable soil, producing sweet, crisp herbage, the butter made from which possesses great keeping properties and a peculiarly delightful taste, the true butter flavor, so dear to those who know and can appreciate it, the absence of which is to be noticed in many of the continental butters, and in some Irish butters made off very rich lowland pastures.

It is found that the excess of fat or oil made off deep rich soil makes them more liable to turn rancid, and reduces their keeping qualities, and that such butters, how-

* This report was prepared by Mr. T. J. Clanchy, a Cork butter merchant.

ever good they may be for immediate use, are not so suitable for preserving or for export to hot climates as the butter from the well-drained upland districts and the lighter but good soils which prevail to a very large extent in Munster. Even from the richest lands of Munster, such as the celebrated Golden Vein, a well-defined belt of land which runs through the province and which is considered to be almost unsurpassed in the world for its fine quality, the soil and climate are so favorable that the butter, although perhaps more suitable for high-class mild-cure make, still possesses considerable keeping powers when properly preserved, although not to the same degree as the produce of the lighter pastures.

The following is the return of acreage under grass meadow and clover in the four provinces of Ireland in 1884:

Provinces.	Acrea under meadow and clover.	Acrea under grass.	Total area under meadow, clover, and grass.
Leinster.....	594,697	2,684,132	3,274,829
Munster.....	594,697	3,293,445	3,886,142
Ulster.....	492,794	2,413,248	2,906,042
Connaught.....	283,542	2,655,483	2,939,025
Total for all Ireland.....	1,962,730	10,346,308	12,309,038

The total quantity of arable land in Munster in 1854 was 4,730,840 acres, of which 3,885,142, or 82 per cent., was under pasture, besides which a large proportion of the arable land was devoted to growing roots and fodder for the winter feeding of stock. Suitability of soil and climate would not, from the butter-producers' point of view, be of much use without a supply of milch cows, and in this respect the province of Munster is well provided. According to the annual Government returns of live-stock for 1885, the number of milch cows in each of the four provinces of Ireland is returned as follows:

Leinster.....	238,636
Munster.....	549,578
Ulster.....	190,871
Connaught.....	438,336
Total for Ireland.....	1,417,421

From which it appears that Munster has more than one-third of the milch cows of Ireland.

The returns of live stock in England for the year 1881 show that the number of milch cows in that country was 1,715,277, and in Scotland 408,745, so that Munster contains very nearly one-third as many milch cows as the whole of England and considerably more than all Scotland.

Taking the return of live stock in Ireland and in other European countries, I find the following to be the result:

Number of live stock and population in the following countries.

Date.	Countries.	Live stock.	Population.
1883	Great Britain.....	5,962,779	29,710,012
1883	Ireland.....	4,096,021	3,174,836
1880	Belgium.....	1,382,815	5,536,614
1880	France.....	11,446,253	37,321,186
1873	Germany.....	15,776,762	45,234,061
1884	Holland.....	1,434,406	4,114,060

From this it appears that while Great Britain has only 20 head of live stock to each 100 inhabitants; Belgium, 25; France, 30; Germany, 35, and Holland 35, Ireland has 79 head of live stock to each 100 people, and in the province of Munster the proportion of live stock to population is even greater, the live stock being 1,361,470 and the population 1,331,115, or over 100 live stock to each 100 inhabitants.

In Ireland cattle have to a great extent replaced human beings. The population of Ireland in 1841 was 8,175,124, while in 1881 it was reduced to 5,174,836, a shrinkage of

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	Total acres under meadow, slover, and grass.
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5	3,885,142
8	2,806,042
3	2,339,025
8	12,309,038

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	Population.
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1	5,171,836
5	5,536,674
3	37,321,186
2	45,234,001
6	4,114,060

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over 3,000,000. The conditions that have brought about this remarkable change, a change which is unparalleled in peace or war, in any country in the history of the world, are well worthy of the thoughtful study of statesmen and economists. Whether this result is the outcome of state policy in the past, or of the accidents of geographical environments, laws, and social system, it equally suggests Goldsmith's celebrated lines, which, by substituting "live stock" for "wealth," apply to it with remarkable aptitude:

Ill fares the land, to hastening ills a prey,
Where stock accumulates and men decay.

The bearing, however, of these figures on the question of the butter supply, is that they show that Ireland has a larger proportion of its butter to export, and less people at home to consume it, than any other country, an additional proof of the great importance of the Irish butter industry to commerce.

The city of Cork, the capital of the province, is the natural outlet for the greater portion of the butter produced in Munster, owing to its central position, its unrivaled harbor of Queenstown, and its direct communication by roads and railways, which tap the principal butter-producing districts. A butter market has been held in Cork for a very long time, and in 1769 it was placed under the management of a committee of the principal merchants, under whom it remained for one hundred and fourteen years, until the present year, when a special act of Parliament was passed, transferring its management to a body of trustees, with power to make by-laws for its regulation.

The quantity of butter which passes through this market is enormous. In the first year, 1769, of the record, 105,309 packages passed through the market, and the annual quantity has since largely increased, being now considerably more than three times as much.

The largest quantity received in any one year was in 1878, when 434,239 firkins passed through the market.

The Cork butter market is held every day, Sunday and a few holidays excepted, and the sales on a single day have been as large as 3,800 firkins of about 75 pounds net, which, when prices were high, would be value for about £12,000 sterling (\$53,398.) All the butter has to be cleared away within the day to make room for another large quantity coming by road and rail for the next day's market. The system of selling butter in the Cork market is peculiar to this market. At a quarter before 11 a. m., buyers and sellers assemble around a table, and at the first stroke of 11 all buying must be concluded, and the whole quantity of butter, frequently some thousands of firkins, has changed hands. To the uninitiated the buying and selling at this table appears to be a perfect Babel, which can only be understood by the brokers and exporters, who keep up a perfect cross-fire of offers and bids until the stroke of the clock at 11, when suddenly all the noise ceases, buying and selling are over for the day, and the buyers proceed to cart away their purchases. The firkin butter is inspected and classified by sworn judges, and all the bargains at the table are made for the various qualities of butter so classified. This applies only to the officially classified butter, but there is now also, since the passing of the recent act of Parliament, an open market, where butter is bought and sold on the judgment of the buyers and sellers themselves, without any official classification.

There is another branch of the trade which is of great importance—that of preserved butter in hermetically-closed cans. Up to very recently there were certain restrictions placed on this branch of the trade in the interest of the dealers in firkins, and, although Irish butter, from its great keeping properties, is, perhaps, the most suitable of any in the world for preserving, this important branch of the trade was allowed to go into the hands of the Danish and French packers, who had several years' start of the Irish tinned-butter preservers, and got possession of the various foreign markets. It is gratifying to be able to state, however, that within the last few years, since the Paris Exhibition of 1873, the Irish canned-butter trade has greatly extended, and has been particularly active in the last two years.

In 1878 the writer of this paper exhibited Irish butter preserved by a special process at the *Concours*, open to all nations, held in the Paris Exhibition, and gained the only gold medal thereat for preserved butter. As a further test of its keeping properties, he sent his preserved butter to the Melbourne Exhibition of 1880, and after crossing the tropics on the voyage out, it gained the highest award, the silver medal and first order of merit. He has since gained a silver medal at Calcutta, and his preserved Irish butter is now (1885) on exhibition in the Government section of the World's Exposition at New Orleans.

The reports from very remote parts of the world, where it has been sent, Java, the Straits Settlements, China, India, South America, Africa, and other tropical and trans-tropical countries, are most encouraging, and there is every indication that Irish preserved butter is rapidly gaining favor all over the world.

The following tables will show the fluctuations in the prices of the finest butter for forty years, ending in 1881:

Tables (prepared by the writer) showing the average price of the finest butter each month, year, and ten years, and the rise in price from the lowest to the highest price each year, for the forty years ending in 1881.

[In shillings per cwt.]

1841 to 1851.

Season.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Average for season.	Rise in price.
1841-42....	111	109	89	89	90	84	89	90	86	89	85	89	90	31
1842-43....	74	99	80	81	75	80	80	78	78	82	83	88	81	16
1843-44....	84	86	73	72	70	69	72	73	73	75	77	74	78	17
1844-45....	80	76	73	71	71	76	81	94	96	94	94	100	84	89
1845-46....	101	90	77	83	83	91	93	94	86	88	91	96	89	24
1846-47....	98	90	74	84	85	93	93	89	92	90	94	102	90	34
1847-48....	105	102	88	85	87	92	91	88	90	94	98	100	93	18
1848-49....	106	94	83	82	81	78	76	75	70	70	70	72	80	36
1849-50....	88	80	65	66	65	68	72	71	73	74	78	74	73	23
1850-51....	88	84	65	66	69	70	81	78	79	80	80	80	80	24
Average...	94	89	77	78	78	81	83	83	82	84	86	87	84	24

1851 to 1861.

Season.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Average for season.	Rise in price.
1851-52....	86	80	68	70	73	75	76	80	77	78	80	80	77	18
1852-53....	86	77	69	69	72	78	79	86	90	95	91	94	82	26
1853-54....	104	102	81	90	93	95	96	98	98	102	104	105	107	26
1854-55....	111	101	92	92	96	96	98	98	102	104	105	107	109	19
1855-56....	120	114	100	105	107	109	114	116	120	121	122	122	118	35
1856-57....	140	130	100	108	108	114	116	119	105	114	118	120	112	26
1857-58....	129	114	109	103	108	114	116	119	105	114	118	120	112	27
1858-59....	122	112	99	104	104	105	105	105	108	120	121	127	130	28
1859-60....	120	112	102	103	106	110	115	117	120	121	127	130	115	28
1860-61....	128	123	107	106	105	106	111	114	115	116	112	113	113	23
Average...	114	106	92	94	96	99	102	103	105	109	111	112	104	25

1861 to 1871.

Season.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Average for season.	Rise in price.
1861-62....	113	111	95	96	97	102	103	105	110	113	116	116	106	21
1862-63....	127	103	93	91	91	98	100	104	105	115	118	119	106	31
1863-64....	120	101	88	87	93	101	103	111	111	117	117	117	106	33
1864-65....	114	101	94	105	112	118	118	117	132	124	124	124	115	38
1865-66....	127	106	102	110	117	120	130	129	130	131	135	136	123	54
1866-67....	132	116	111	113	114	114	115	112	111	120	120	121	109	21
1867-68....	122	108	100	99	97	102	106	105	105	107	115	120	118	25
1868-69....	128	106	102	109	121	127	130	131	136	145	144	138	126	42
1869-70....	130	105	103	104	111	119	125	128	131	135	133	135	122	29
1870-71....	130	108	111	117	125	130	130	130	138	146	148	150	130	42
Average...	124	107	100	103	108	113	116	117	121	126	128	128	116	32

1871 to 1881.

Season.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Average for season.	Rise in price.
1871-72....	147	120	118	117	118	121	129	130	132	135	135	135	128	30
1872-73....	136	116	114	111	115	122	125	124	129	138	139	140	125	29
1873-74....	142	120	115	114	119	129	135	150	145	151	155	156	135	42
1874-75....	154	121	123	129	141	146	149	150	153	155	155	155	141	31
1875-76....	145	119	120	120	119	129	138	140	145	148	150	160	135	41
1876-77....	145	130	124	127	135	149	150	146	154	158	158	150	144	34
1877-78....	142	119	119	117	115	126	123	121	130	132	138	140	126	25
1878-79....	147	115	104	101	109	113	115	119	126	128	128	133	120	46
1879-80....	127	103	87	79	78	105	120	128	139	149	140	147	116	69
1880-81....	148	112	112	115	124	133	139	136	143	143	143	143	131	31
Average...	144	117	114	113	117	128	133	133	140	143	144	146	131	38

(per each month,
at price each year,

For the five years which have passed of the current decade, prices have been made lower and the tendency seems to be still lower prices.

The present year is the cheapest for a long time back, the butter market feeling the effect of the great depression in prices as severely as other classes of farmers' produce.

For the ten years ending January 1, 1881, a little over 4,000,000 firkins of butter passed through the Cork market, or an average of 400,000 firkins a year, which, if valued at £3 10s. (\$17.03) per firkin, would give an annual total of £1,400,000 (\$6,813,100) as the yearly value of the butter sold in the Cork butter market during these two years.

T. J. CLANCHY.

THE BUTTER INDUSTRY OF IRELAND.

[Evidence of William J. Lane, esq., before committee of House of Commons.]

To discuss the question of the Irish butter industry from either the farmer's or trader's point of view would be an inexcusable mistake. Its national importance could hardly be overestimated. The manufacture of butter is the staple industry of Ireland, and any close student of what is going on in other countries must recognize that the future agricultural prosperity of Ireland largely depends on the full development of its dairy industries. While British free-trade legislation continues it would be simply impossible for Ireland to compete, as a grain-producing country, with the ever-increasing wheat areas of Canada, United States, Russia, India, Egypt, and Australia.

The approximate number of cattle in the United States is 51,000,000, and the possible increase may be estimated by the fact that the pasturage lands west of the Mississippi exceed 780,000,000 acres. Each year the cattle-raising industry of the United States makes a vast stride, and year by year the development of the American railway-systems and the competition of ocean-carrying lines enables the surplus produce of America to be landed on our shores at prices with which Irish farmers cannot compete.

The threatened competition of Australia and South America in the meat markets of Great Britain, by means of refrigerator transportation, should not be minimized or ignored as another source of danger to the Irish cattle trade. These facts justify the assumption that Irish farmers cannot, in the future, look forward either to the raising of grain or cattle as a remunerative employment. Barley and oats, of course, may yet be regarded as paying crops, but, like all others, they also are menaced in various ways. By climate and the nature of its soil Ireland is specially adapted to the manufacture of butter, and its geographical position certainly gives it great advantages for the speedy marketing of its produce, as compared with the other countries rivaling it in the butter trade of England.

Addressing the Royal Dublin Society in December, 1879, Professor Sheldon valued that year's make of Irish butter at £6,181,818. I have no hesitation in saying that by proper development the butter produce of Ireland could be raised to an annual value of over £12,000,000, with even the same number of cows. This is not difficult to calculate. With the present very inferior breed of dairy cattle in Ireland, the average annual production of milk per cow may be put down at 430 gallons. It requires 3½ gallons of the milk yielded by these cows to produce 1 pound of butter by the ordinary methods of setting and churning. This gives a return of 123 pounds of butter per cow. The cows on the Munster model school farm give an average annual yield of 690 gallons of milk, which, by the use of the separator, produced an average yield of 276 pounds of butter per cow. Mr. Richard Barter, of St. Anne's, Blarney, attains an average of 228 pounds of butter per cow in his improved dairy. Taking a far lower standard than Mr. Barter's of what might be achieved by an improved breed of dairy cows, and an improved method of manufacture, I do not think a yield of 205 pounds of butter per cow would be an impossible achievement, which would be an increase of two-thirds on the quantity made at present. To estimate the increased price which would be obtained for Irish butter manufactured on the most improved continental systems at one-third of its present value needs no figures to support the assumption. Should the accuracy of the above figures be questioned, which is quite possible, because there are no standard records of the produce of the average dairy cow of the Irish farmer, I can fall back on the wide room there is to support a vastly-increased number of dairy cows in Ireland, to sustain my theory that the butter produce of the country can be raised to an annual value of £12,000,000. This sum would pay two-thirds of the present rental of Ireland, and if the dairy resources of Ireland were

March.	Average for season.	Rise in price.
80	90	31
88	81	16
74	78	17
100	84	20
90	89	24
102	90	28
100	93	18
72	80	36
73	73	23
89	80	24
87	84	24

80	77	18
94	82	26
107	98	26
107	100	10
122	109	21
122	118	35
126	112	26
126	112	27
130	115	28
113	113	23
112	104	25

116	106	21
119	106	24
117	106	33
121	115	38
136	123	34
129	118	21
121	109	35
138	126	43
125	122	29
150	130	42
138	116	22

135	125	30
149	125	29
156	135	12
155	141	31
160	135	41
150	141	34
140	126	25
133	120	46
147	116	69
143	133	31
146	131	38

developed to their full capacity, the whole present rental should be paid by the butter produce alone. This shows the great national importance of the Irish butter industry, and it is as a great national question it should be discussed.

It would be very difficult to convey to the minds of persons outside the Irish butter trade the very low level to which Irish butter has fallen in the markets of Great Britain. Perhaps its position could not be better illustrated than by stating that in Dublin, the capital of Ireland, the requirements of the consuming public are almost entirely catered for with Danish butter and Dutch butterine. One line of steamers from Rotterdam has brought no less than fourteen thousand packages of butterine to Dublin since the 1st of January, and very large quantities manufactured in other countries have been brought by other routes, the exact amount of which could not be ascertained. When this is possible at a time when the produce of Irish dairies was being sold at 5s. 6d. per pound, and the best at 9d.; no surprise need be expressed at the exclusion of Irish butter from London, Manchester, Liverpool, &c. As a matter of fact Irish butter can only be sold now with very great difficulty in a few of the manufacturing districts of England, and the area of its consumption is becoming more limited every year. Its competition now is rather with the produce of the butterine factories than with the butter shipped from France, Denmark, Germany, and Sweden. Butterine has realized a higher price in the English and Dublin markets for the past twelve months than secondary grades of Irish butter, and the bulk of Irish butter, unfortunately, is of secondary quality. The price realized for Irish butter is simply ruinous for the Irish farmers, and with a continuance of the existing system of Irish dairying, the prospect is most disheartening. It simply means agricultural ruin, and agricultural ruin means national bankruptcy for Ireland. I have measured and do not shirk the responsibility of this statement. The sooner it is recognized by every one interested in the welfare of this country the better.

That there is no natural impediment to Irish butter excelling the produce of all other countries is clearly established by Mr. T. J. Clanchy, of Cork, having obtained the gold medal at the Paris Exhibition of 1878, and medals at the exhibitions of Calcutta and Melbourne, from all competitors, with the butter of selected Irish dairies, and, also, by the extreme high prices commanded on the London market for the butter of one or two factories established in Ireland, on the continental system, by the Rev. Canon Bagot. What, then, it will be asked, has caused the decline of the Irish butter trade? I do not hesitate to place the responsibility for it on the neglect of our Government to provide for the education of our farmers, as has been done by the Governments of all those countries which have excelled us in the manufacture of butter for the last thirty years. With paternal solicitude they spared no efforts to bring education on dairy-farming within the reach of their agricultural populations. The success of their efforts is evidenced by the prosperity of their dairy industries, as also by the sad plight of the Irish dairy farmer, who has been left unassisted and uneducated in the keen competition forced on him by his European and American rivals.

The ruin which is now impending over the dairy farmers of Ireland, and the general agricultural depression of this country, is rebuke sufficient for the apathy and neglect the Government that undertakes to rule us have exhibited towards Ireland's best interests. The Governments of the United States, France, Germany, Denmark, and Sweden have all recognized their responsibility of practically educating their agricultural subjects, and have spared neither money nor trouble in efficiently discharging that duty. The Government of Ireland has done nothing for the Irish farmers. The farmers of Ireland had a far stronger claim on the Government than those of any of the countries above named. Because, owing to past British legislation, they were denied education, and, owing to the Irish land-laws, they have been always kept on the border of poverty. They were thus prevented from doing for themselves what was done for the educated and prosperous farmers of other countries by their respective Governments. I do not want to introduce politics, unnecessarily, into this statement, but it is impossible to exclude the attitude of the Government of Ireland from the discussion of a question which so very largely hinges on the measures that have been adopted by the Governments of those countries which have so successfully driven Irish butter out of the markets of Great Britain. Without the assistance and education given by the continental Governments their dairy farmers could never have beaten Irish butter out of the markets. Up to the time these Governments made dairy interests a state care, Irish butter, through force of the superiority it derived from the natural advantage of soil and climate, was highly prized not alone in England but in every country penetrated by British commerce. Year by year, as education improved the make of butter in other countries, the prestige of Irish sank lower and lower until it has come to that point beyond which it cannot go without extinction.

Situated, then, as they are, through no fault of their own, the Irish dairy farmers are utterly unable to help themselves in this uneven struggle with the state-supported competition of other countries. Their ignorance of even what is causing the depreciation

of their produce (as is evidenced by the complaints in the Irish press against the Irish butter merchants), and their utter inability through want of capital to provide either an improved breed of dairy stock or the proper appliances for modern dairying, make an unassisted effort to maintain the struggle for existence a simple waste of energy. In other countries the resident nobility and gentry largely aid the schemes of Government education by maintaining large model dairies on their estate, where Government teachers instruct the tenantry, by practical dairy experiments, and by the sale of calves off these farms, the breed of the best dairy stock is disseminated amongst the smaller dairymen. By having the center of attraction in London, Irish noblemen and large landed proprietors live out of the country, and even this supplemental assistance and education which is given on large estates on the Continent is denied to the Irish farmer. Besides the large endowments given by every State in the Union for agricultural colleges, the American Government spent \$475,719.26 last year in circulating knowledge in agricultural matters amongst the wealthy farmers of the United States.

What has been done, and is being done by European states to promote scientific dairy-farming has been so often placed before the public of late that I need not recapitulate it here. A reference to the United States consular reports will reward the inquisitive on the point. I have said enough to prove that it is the paramount duty of the state Government to come to the assistance of the Irish dairy farmers, and to do so quickly if they are to be saved from annihilation, and Ireland from overwhelming disaster, the Government must fully recognize that they alone, by neglecting their obvious duty, are responsible for the existing crisis, and half measures of assistance, or feeble experiments will be of no avail. I am not concerned with the general agricultural requirements of Ireland, and must therefore only confine myself to such parts of a general agricultural improvement scheme as I think imperatively necessary for the proper development of the manufacture of Irish butter. In the United States the Department of Agriculture at Washington looks after the interests of agriculture over their whole territory; it is presided over by a minister, assisted by a scientific staff. Each separate State, there, has its own agricultural colleges and farms.

I do not think we need go farther for a model of what is wanted in Ireland. We want a department of agriculture in Dublin, whose duty (*inter alia*) should be to direct a system of dairy schools and farms in every county to train teachers for those schools; to collect and disseminate information on every subject connected with the most improved systems in other countries; to import and experiment on the best breed of dairy cattle, and distribute them on the state dairy farms of the counties for which each breed was best adapted, to provide Government loans to farmers for the erection of dairy and cow houses, and in every other way to promote the general dairy industry of the whole country. There should be a Government dairy college in every county, and, to fulfill its mission properly, a farm of dimensions proportionate to the number of pupils, who, from the agricultural population, might be expected to attend, should be attached to each. The scale of fees charged should be within the reach of small farmers, and scholarships ought to be awarded at an entrance examination, to induce intending pupils to study elementary subjects connected with dairying. In some of the large agricultural colleges on the Continent, the Government contributes a grant for each dairy maid equivalent to the difference between the value of her work and her expense on the establishment; she pays nothing for her education. In the Swedish colleges the cost of maintaining a dairy maid for a year is £18, her work is valued at £7, and the Government contributes £11. The produce of the dairy leaves the establishment a profit. In such colleges the agricultural male pupils pay high fees. On these Irish county farms a herd of pedigree bulls and cows should be maintained, the former should be available to the farmers of the district on payment of a fee, and the latter (of different breeds) should be experimented with to test their milk and butter producing capacities in the different kinds of pasturage in each county.

The importance attached to this point on the Continent may be gathered from the fact that there are different staffs of Government professors employed for eight or ten years consecutively examining with the most accurate scientific precision (even by analysis of the skimmed milk and buttermilk) the produce of all the various breeds of dairy stock on every different section, so as to decide by what artificial foods the pasture grazing should be supplemented on each farm to maintain a maximum butter produce. The same scientific precision informs the farmer of each district at what temperature the dairy-house, the cow-house, the cellar, and even the drink of the cattle must be maintained for every week of the year; in the same way he is guided as to comparative advantages of the dry tub, water, ice, and separator system in obtaining his cream, and even to the effect which the difference between 2,400 and 2,500 revolutions per minute of the separator will cause on the quality of the cream. I digressed to show by what means the perfection of dairy farming has been accomplished on the Continent.

The total absence of what may be called any high-milking stock in Ireland is one of the gravest features of the situation. Even amongst those who go in for keeping

very high-class cattle in Ireland, the greatest attention has been paid to the strains that produce most beef, at the expense of the loss of the milk. In other countries they breed dairy stock for milk first and beef afterwards. They consider it pays them better to get a high return of butter for some years and lose a little on the sale of the cow. In a very few years a small herd of a good strain of milkers on each Government farm would disseminate good milking blood through the whole dairy stock of Ireland. At present, the general run of farmers never know what kind of stock their dairy cows are derived from; they buy them on chance, in fairs and markets. Some idea of what may be done in the way of breeding for milk may be gathered from the fact that in America particular strains of Jersey cows yield from 90 to 100 pounds of butter per month, and there are authenticated records of cows yielding 105 pounds of butter per month for a season. Of course these cattle are only fancy breeds, but it shows what might be done on Government farms. The particulars of these records can be found in the *Breeders' Gazette* of America. It is unnecessary for me here to state what should be the training given in such dairy schools to pupils. There should be a seed-testing station attached to each, as one of the greatest drawbacks to small dairy farmers in Ireland is the wretched class of seeds imposed on him by unscrupulous dealers. I am informed by practical farmers of great experience that it is owing to the deleterious adulterations of grass seeds that the increased aborting of cows is mainly due. This source of loss to the Irish dairy farmer is increasing year after year. It is being anxiously investigated by the American Government, and different authorities ascribe its spread to different causes. It illustrates the necessity of having a veterinary as well as a seed department in each school. Each of these county establishments should be provided with a traveling dairy, and its working, illustrated by a competent lecturer, should be exhibited at the large fairs and other centers where the agricultural community could be instructed. A model dairy and permanent exhibition of improved appliances might with very great advantages be established at the Cork Butter Market, where hundreds of farmers could see it in operation every day. Dairy education must be brought within reach of the farming masses, poor as well as rich. I think elementary education on dairy farming should form part of the national school system. Government should supplement the funds of agricultural societies to enable them to offer attractive prizes for successful dairying. Without proper dairy and cow house accommodation no amount of education would enable the Irish farmer to produce good butter. They are practically without one or the other at present, that is, as these buildings are understood in dairy countries, on the Continent and in America. Milk, cream and butter are most susceptible of taint from any kind of bad odors or impure air. The most frequent complaint against secondary Irish butter is its peaty or smoky flavor. This is contracted by having the milk set, and the butter made in the ordinary dwelling rooms of small farmers. Impurities also attach to the milk, owing to the filthy condition of the cow from bad stabling. Therefore a model well-drained cow-house is of as much importance as a model dairy. Loans on favorable terms should be given to the farmers to erect those buildings, and I think it would be well if the Government prepared model plans for each class of building, and insisted on their being all constructed according to those plans. The cost could be fixed by scale, in proportion to the number of cows to be provided for. The expense of obtaining such loans should also be regulated by a low fixed scale. In asking so much assistance from the Government for Irish dairy farmers, I do not ask for more for them than has been done by other Governments, and I do not see why these county farms should not be, at least, self-supporting. No scheme of improved dairying will quite enable the Irish farmer to compete favorably without extension of the present means of transportation. Ireland must be opened up by either tramways or light railways, and until some cheaper and quicker means of being able to construct them than exists at present is provided by legislation, limiting and reducing the power of factions opposition, this development will be of very slow growth. If the Government recognize the strong claim the Irish dairy farmers have on them, and even at the present hour undertake to provide the assistance I ask for, then there is still ample room to hope for a speedy revival of the Irish butter trade and the prosperity of the country. With proper manufacture Irish butter must lead the market, on account of its natural superiority and flavor. Of course a great deal will have to be done by all who have to handle the improved make of butter, so as to put it in the markets in the most attractive shape. The packages must be greatly improved—I would recommend white packages, of 56 pounds, as most likely to be received favorably. They should be so shaped that they could not be rolled; this would save the butter from great abuse, and keep the packages clean. I see no reason why our butter packages should not be made of *oak*, which grows in Ireland most abundantly, and, which, consequently, would cost less than imported oak.

There is an objection to it on the ground that butter does not keep so well in *beech* as in oak casks for a lengthened period. In the future there will be no necessity to keep butter any time in casks, and prejudices of this kind should not be permitted

to interfere with the utilization of this native timber, which is now practically worthless when grown in quantity. The most scientific butter-producing countries, Denmark, Sweden, Germany, and America, use nothing but bees' packages, while we in Ireland, through our ignorance, send from £50,000 to £100,000, annually, out of the country for imported oak. In this connection, I cannot omit referring to the very bad treatment which Irish butter receives from both our railway and steamship companies. They handle it roughly, which, of course, injures the quality, and neither on their platforms, wharfs, trucks, or steamers, do they make any special provision, in the simple matter of cleanliness, for the proper transportation of Irish butter. The consequence is that very often a shipper is not able to recognize in the begrimed casks delivered in London or Manchester the clean packages shipped at Cork or Waterford. In this matter a great injustice is done to Irish butter. In the local rates from producer to market, and in the general rates from Irish markets to the English centers, Irish butter is very heavily handicapped by excessive charges. Butterine is brought from Holland to Dublin at less money than Cork butter could be delivered in Dublin. Butter is brought from New York to Liverpool at less money than from Cork to the same port. It costs 42s. 6d. per ton to send Cork butter via Dublin to Bradford, and Danish butter is brought from Copenhagen via Hull, Bradford, and Liverpool to Dublin at 25s. per ton. The Irish carrying companies are doing their best to kill the Irish butter trade. I wish a deputation of their traffic managers would visit France and Holland to see the delicate handling which butter receives from the carrying companies there, and the scrupulous cleanliness of the trucks and steamers specially reserved for butter traffic. What is wanted in Irish butter is cleanliness in make, packing, and transportation, close grain, and fine texture, total exclusion of water, freedom from oversalting, even quality, even color, and uniformity of weight. I cannot conclude this paper without referring to the butterine trade. It would be childish to say that because butterine interferes with the sale of butter therefore it ought to be suppressed. When manufactured from wholesome ingredients and sold under its proper designation it is as legitimate an article of food as any other. But when the trade is conducted as it now is, most dishonestly, it ceases to have any claim to considerate treatment. In this week's issue of *The Grocer*, one of the largest wholesale houses in London advertises to sell it as finest Irish firkins and fine Irish firkins; a Dutch firm offers, by circular, to make it so as to imitate any well-known butter—Irish firkins and Irish roll being specially mentioned. Every week's police office reports contain records of fines imposed for selling butterine as butter. In Dublin last week several firms were fined £10 for selling Dutch butterine as Irish roll butter. I have no hesitation in saying that I believe nineteen-twentieths of the butterine sold in Great Britain is consumed as butter. Irreparable damage has been done to the dairy interests of these countries by this nefarious trading, and Parliament should intervene to put a stop to it. This compound has no claim to the name butterine; it is adopted to deceive the public. This name should be prohibited. Let these compounds of fat be called margarine or oleomargarine. If, as they claim, the manufacturers depend on its intrinsic merits to sell it, they need not fear adopting its true designation. Every package imported into the country should have either of those names branded on it in letters one inch long, and also the name or the manufacturer or his trade-mark. Every package issuing from a British factory should comply with the same conditions. Every shopkeeper selling any quantity of these compounds should be bound by law to mention the name of the compound to the purchaser. If these conditions be enforced, with the same penalties as they (or similar provisions) are enforced in other countries, no injustice will be done to honest traders, and a great act of justice will be done to dairy farmers, who have quite enough to face in the keen competition of honest rivalry. The existing powers of dealing with this gigantic swindling are utterly inadequate. Unless from those who are interested in maintaining fraud, I don't see where any opposition could be given to legislation in this direction.

FRANCE.

CATTLE BREEDS OF FRANCE AND THEIR PRODUCTS.

REPORT BY CONSUL WILLIAMS, OF ROUEN.

INTRODUCTORY.

In compliance with the request of the Department of State to examine and report upon the subject mentioned in the cattle circular addressed to the consuls of the United States I have categorically answered the questions therein propounded (see statement at close of report) and will attempt to render the work more complete and practical by such descriptions, illustrations, and information as I have been able to obtain from personal observation of the different breeds of cattle in their original homes and from other reliable sources.

This consulate embraces a large portion of the ancient district of Normandy, is situated in the northwest portion of France, and well adapted by its fertility and abundant supply of water for grazing purposes, and has long been distinguished for the peculiar and marked type of its cattle and horses, and affords a wide field for the study of the races of cattle indigenous to France; while its contiguity to Great Britain on the one side, and Belgium, Holland, and Germany on the other, renders great caution necessary to discriminate between the original and mixed breeds. We reserve the title of distinct breed to a number of individual animals presenting uniform characteristics, shapes, and adaptabilities, and capable of transmitting and perpetuating this type in their progeny. There must be this fixity to constitute a race.

DISTINCT FRENCH BREEDS OF CATTLE.

France appears to have a substantial claim to eighteen distinct breeds of cattle, of which I append a list, adopting the French nomenclature:

(1) Flamande, (2) Normande, (3) Bretonne, (4) Parthenaise, (5) Charolaise, (6) Limousine, (7) Mancelle, (8) Comtoise, (9) Femeline, (10) Bressane, (11) de Salers, (12) Garonnaise, (13) Bazadaise, (14) Landaise, (15) Gasconne, (16) Barétone, (17) Béarnaise, (18) d'Algérie.

Although many other varieties of cattle are found in France than those enumerated above, I cannot view them otherwise than as traceable to the foregoing parent stock, or the issue of imported animals, which will receive passing notice in considering the cattle of France.

The description of a breed is not easy to outline, but I will endeavor to sketch the chief characteristics of a group of which the individual specimens present various traits.

FLEMISH CATTLE.

Origin.—The origin of this breed is not precisely known. It is probable that this race originated on the shores of the North Sea, whence came the breeds of Holland, Schleswig, Holstein, and Jutland, all re-

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FLEMISH COW



Antiquary, 1878

COW FLAMANDE.
— 1847 —

BULL FLAMANDE.
1307-1311. 45. 317



Julius Brent & Co. Lith.

BULL FLAMANDE.

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Julius Rosen & Co. Inc.

FLEMISH BULL



Julius Brand Co. Lith

FLEMISH OX

COW RACE FLAMANDE.

1848-1850



COW RACE FLAMANDE.



Julius Benn & Co. Lith.

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markable for their milking qualities. The center of production and rearing of the best specimens of the breed "Flamande" is in the departments of the north of France, in the rich pastures of Bergues, Dunkirk, Cassel, Bailleul, Hazebrouck, and Lille.

We meet with less numerous herds, more or less distinct and pure, in Boulonnais (termed Boulonnaise), in Artois (Artesienne), in the departments of the Somme, Oise, and Aisne (there termed "Picarde"), upon the borders of the Sambre (Maroillaise), and about Bordeaux (Bordelaise). The Bretonne breed has contributed its share to the production of the latter variety of this race.

In its original home there are two varieties of this breed, that of the region of Bergues and that of Cassel.

The variety of Bergues, or Berguenarde, has slightly greater length of horns, is thicker set, and is adapted to fattening and yielding milk. It is carefully maintained for both purposes. The animals reared about Cassel are finer and more sought for, being preferable to those of Bergues for dairy purposes.

Description.—The Flamande breed is essentially valuable for the dairy, and incidentally only for food, and is not adapted to work, and is destined to predominate in the dairies of the northeast of France. I will therefore more particularly describe some of the peculiar features of the cow of this breed.

The head of a good cow is fine, of conical form, rather long; the nape of the neck thinly covered with hair; the horns wide apart, fine throughout, projecting forward and downward, and in such a manner that in some animals they bend back and touch the forehead; they are small, white or yellow, with black tips; the ear is blunt, moderately large, and covered with fine hair; the eyes projecting and black, with a mild expression; the forehead long, and ordinarily narrow, terminates in a snout slightly protruding, of black or mixed color; the neck long and thin; the brisket is prominent and well hung; the withers, well developed in the best types of Bergues, are small in ordinary specimens; the line of the back is straight, with a slight depression at the junction of the back with the loins, due to the separation of the vertebra—greater strength of spine and loins would be desirable; the hips, often protruding, measure between one another from 24 to 26 inches; the buttocks are equally prominent and wide apart; the base of the tail is low, sometimes a little raised by the protrusion of the sacrum, of which the line is not sufficiently grounded with that of the coccygeal bones; the tail is fine and long, terminating in a thin tuft of hair; the chest is narrow and confined, and the ribs rather flat (the cattle raised in Bergues and Cassel have a tendency to lose these defects); the belly is of moderate size, but ample towards the flanks and mammary region, of which the loins are well developed and occasionally forked; the bag large, round, often of a brown or spotted color, and well hung; the teats are of moderate size, covered with fine skin and soft hair; the shoulders rather flat and moderately muscular; the hoofs black; legs flat and the buttocks sometimes depressed; the coat reddish brown, ordinarily of deeper tint towards the head, and sometimes there appears on the flanks, on the head, and especially on the cheek, white or speckled spots, and these are considered signs of pure blood. Many of this breed are found in Flanders of bright-red color or deep brown, others roan, but the reddish brown is considered the type of the race.

The traits sought for by the breeders of this race in the cow are those which would indicate an aptitude for milking, without an inclination for fattening; a certain harmony of form, a little gaunt rather than too

much rounded; a bony, well developed frame, giving size to the body; the hind quarters relatively more developed than the fore quarters; the flanks large and deep, joined to a good-sized and well-hung bag, terminating in regular teats, with skin supple and soft, rather than too fine; a head with little flesh; a lively and at the same time soft expression of the eye; in short, all of the well-known characteristics which present a feminine aspect to the eye of an expert.

Milking qualities.—There are Flamand cows yielding 35 to 40 quarts of milk per day. This yield is quite exceptional; is only attained at the expense of the richness of the milk, or to the great injury of the race itself. In the Flamand country the average yield of a good cow is about 2,640 quarts per year, or 10 quarts a day during the season of pasturage for two hundred and ten days, and 6 quarts per day during the season of winter, and remaining dry for two months.

Weight.—The weight of such a cow is about 1,000 to 1,200 pounds; size at the withers, 53 inches; at the croup, 55 inches; the length from the nape of the neck to the withers is 5 feet 3 inches; from the withers to the level of the joint of the buttocks, 4 feet 9 inches; the head, 9.7 inches; the circumference of the body behind the shoulders, 6 feet 3 inches; the size of the haunches, 2 feet 3 inches, and the height about 2 feet 6 inches from the ground.

Flamande bull.—The best breeders select the bulls of this breed from those contrasting with the cows and supplying the deficiencies of the cow, but with a feminine appearance, not disregarding the signs of a vigorous constitution. Thus, the preference is given to bulls with a low-hung body; tail, loins, and thighs muscular. Experience has demonstrated the success of this method of improving the species.

It will be noted that in this description of a race reared for its lacteal qualities are certainly found many features which would commend it to the butcher, and this view is corroborated by the fact that these animals are highly prized by the consumer. A glance at the bull of this breed corroborates this fact and indicates clearly the adaptability of the race for fattening purposes. The color of the coat is of a deeper tint than that of the female; the head sizable; snout fine, neck moderately full; throat and dorsal muscles sufficiently supplied; shoulders rather small; the body raised and slightly pointed; defects which yield to good treatment.

The weight and measurement of a bull of this race aged thirty months, raised in the department of the north, I herewith subjoin with cut.

The Flamand ox is exceptional, the females being universally raised; the few oxen are raised with a view of exhibiting at the agricultural fairs.

The Flamand ox has been utilized at the beet-root sugar manufactories of the north, and if not subjected to severe labor, they fatten readily on the refuse of these factories.

BREEDS OF SUB-FLAMANDS.

In traveling on one side from Dunkirk to Boulogne, Montreuil, and Abbeville, and on the other toward Arras, by the way of Saint Omer, we find modifications in the race Flamande. In the former place the name of "Boulonnaise" is given to the subrace and that of "Artésienne" to that in the ancient province of Artois, although these two subraces are frequently confounded with the mother race. The subrace "Boulonnaise" is of smaller size and less weight, its shape more slender and angular, while the belly and flanks are more fully developed, the

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Julius Brön & Co. Lith.

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croup and loins large and lean, the udder large, indicating good milking, the hair equally red or reddish brown, and the body nearer the ground. The quality of the pasturage and the care have great effect upon the shape and size of the different species.

The cattle buyers give the name of "Bournaisienne" to the "Boulonnaise" raised about Desvres, Samer, Hucqueiers, and Fruges, small districts formerly known under the name of "Bournais." Under this head is found the "Namponnoise," the variety "Boulonnaise" of the arrondissement of Montreuil as well as of the valley of Authie, derived from Nanpont, a village situated at some distance from the mouth of this river. Toward Boulogne, Marquise, and Calais, the race is larger and becomes identified with the pure Flamand.

The subrace Artésienne, more generally wholly confined to pasturage, which often becomes scanty, is less developed than the cows of Bergues, and even of Saint Omer, is more slender and smaller, but its constitution is less lymphatic. The breeder of these excellent cattle is reluctant to cross them with any other, and fears to impair their milking qualities, which have not been improved by crossing with the Durham, and their adaptation to fattening is unnecessary to develop. It is said that heifers of this breed occasionally become so fat as to remain sterile.

This race includes about one million or more, which number is increasing, constituting about one-twelfth of the entire cattle of France, and of this number four-fifths are found in the eight departments of France, beginning at the north and comprising the adjoining districts. The price of these cattle range from \$130 to \$175, according to age, weight, &c.; some animals bring \$200, and even more. Bulls of this breed are in constant demand from Holland and Belgium.

THE NORMANDY BREED.

The origin of the Norman breed seems unknown, in fact has never been traced. It is considered that the nature of the soil has produced the breed. It seems to have changed very little in the last century and is very remarkable. The center of production of this fine breed is comprised in the departments of Eure, Manche, Calvados, and Orne.

DISTINCTIVE CHARACTERISTICS OF THE NORMANDY BREED.

The distinctive character of this breed is an unprepossessing bony frame, long and heavy head, large snout, a large mouth, such as is found in animals of large appetite; sleek horns, often short and twisted forward towards the forehead; body long, backbone presenting bony protuberances and depressions in the cows advanced in age; neck relatively strong; shoulders muscular; breast rather deep, often contracted; belly large; flank large and hollow; hips ordinarily slightly spread by corpulence; croup small; rump slightly developed; hind part narrow, but with well-developed and well-formed bag, and ordinarily the signs of good milking; limbs short; skin thick and hard, showing signs of slow growth; coat variable as to color, brown, roan, and red, or piebald; never fails to present brown streaks scattered over the surface of the body. This has given rise to the term "brindled."

VARIETIES OF THE NORMANDY BREED.

This breed has varieties more or less distinct. In Contentin and Bessin, which extends from Cherbourg and Lisieux, comprising Valognes, Carentan, and Isigny, a country which is celebrated for its but-

ter, the race takes the name of "Cotentine," and is remarkable for its lacteal qualities. It is called the "race Augeronne" when it is found in the valleys of Auge, whence the large cattle for the Paris market are largely supplied. They give the name of "Augeron," however, to all domestic animals of that region. They say "Augeron horses," "Augeron hogs and sheep." I have been thus particular to explain, as buyers might be unnecessarily confused.

THE MILKING QUALITIES OF THE NORMANDY BREED.

The claim is made for this breed, and especially those denominated "Cotentine," that they were the first milking race in the world. However this may be, it is incontestable that they possess admirable milking qualities. We meet with cows all over Normandy which give 35 quarts in twenty-four hours, and they have been known to produce 50 quarts. The average yield of milk is about 3,000 quarts per year, or about the same as that for the Flamand race. Unfortunately it is a fact well recognized by dairymen that the production of milk is an inverse proportion to its richness or capability of furnishing butter, and it has been stated that 32 quarts of milk from a cow of the Normandy breed produced but $2\frac{1}{2}$ pounds of butter (1 kilogram), while it is calculated that from 25 to 27 quarts of milk would suffice ordinarily to make the same amount of butter. The English allow 9 quarts, if the cream and milk are beaten together, for a pound; and 13 quarts if the cream alone is churned.

But only a limited confidence can be placed in the above figures, as the richness of the milk varies not only according to the nature of the cow, but also is greatly influenced by numerous circumstances, such as the food, the gestation more or less advanced, &c. It is admitted by scientists that the cows which furnish the most milk do not give the most butter; but, as far as I am able to inform myself, the variety Cotentine, of the Norman breed, is an exception to this rule, and produces an abundance of milk, and this milk yields relatively a quantity of unexceptionable milk.

ISIGNY BUTTER.

The butter of Isigny is undeniably as good as the world produces. Seven and a half millions of pounds of butter of Isigny is annually consumed at Paris. If a calculation was based on 35 or even 27 quarts per kilogram ($2\frac{1}{2}$ pounds), the production of milk would be fabulous for so small a district. However, this is not a sure test, as all the butter called "Isigny" is not made there. The conclusion that the butter of Isigny is better than any other in the world is an affair of patriotism, for we find the "Flamande" lauded in the same manner; the Hollanders say the same of the race Hollandaise, the Swiss of their admirable races Switz, Fribourgoise, and Bernoise.

The reputation is, however, merited in this case, and proceeds from three distinct causes—the stock, the excellent grass, and skill and care in making the butter.

The Normand cow is found all over France, and often furnishes only fair butter elsewhere.

THE NORMANDY AS MEAT CATTLE.

The race Normande furnishes many of the largest animals for the Paris market, notably an ox of six years weighing 1,970 kilograms (4,335 pounds), but it only returned 2,197½ pounds of net meat and 125

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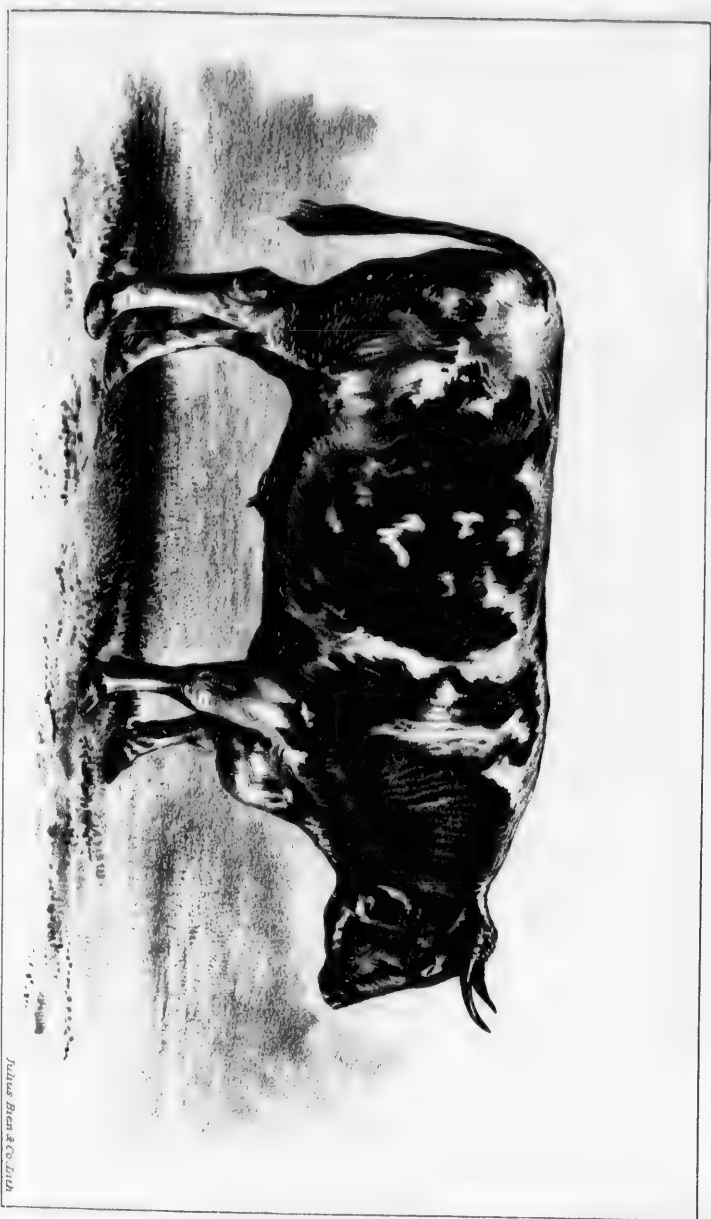
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DURHAM SCHWITZ COTENTINE PRIZE OX



Julius Riess & Co. Lith.

PLATE 11



DURHAM SCHWITZ NORMANDE PRIZE OX

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kilograms (275 pounds) of fat. Another of these monstrous animals weighed 4,185 pounds, and measured 2^m 45^{cm}, or 8 feet, at the withers, and 2^m 97^{cm}, or 9 feet 9 inches, from the head to the base of the tail.

Their comparative aptitude for work is very slight, a small pair of Gascon, Bandois, or de Salers oxen would soon tire out these huge Cotentines.

The meat of this breed is highly esteemed in regard to quality, but the small proportion of net weight of meat and the great proportion of bone (of make weight) is quite striking. Many attempts have been made to overcome this difficulty without interfering with the extraordinary milking qualities of the breed, but with very indifferent success, and the breeders rest content with the oxen which they have, knowing that in the best dairy races the ox is secondary.

THE DURHAM-SCHWITZ-NORMAND.

There seems no good reason why the cross of the type de Schwitz, which has been frequently tried, should improve the breed. In the opinion of Norman breeders the race Cotentine is the best for milk to be found in Europe, the race Sewitz could not improve it in that respect, and it is not wonderful in its product of meat.

This half-breed has been again crossed with the Durham, and given rise to a new race, termed the "Durham-Schwitz-Normand."

Many rather remarkable specimens of this type have been exhibited. Their characters were those of the Durham, with less fineness of bone and skin. This new race seems to have no advantage over the cross-breed of the Durham and Normand. The amelioration of the race Normande, in view of its chief aptitude, can only be obtained by selection.

THE BRITTANY BREED.

The race Bretonne occupies nearly exclusively the five departments which are comprised in the ancient province of Bretagne, consisting of the departments Côtes-du-Nord, Finistère, Morbihan, Loire Inférieure, Ile-et-Vilaine. Bretagne possesses only one race of cattle, the race Bretonne—strange coincidence in France, where each province numbers many breeds among its stock of cattle. This breed is very numerous and contains about 1,500,000 head of cattle, or about one-eighth of all the cattle of France.

It presents varied developments according to the fertility and cultivation of the soil where it is found, but everywhere is found some type that indicates its origin from the department of Morbihan.

Origin.—Various origins are given to the race, such as that it is a degradation of the race Hollandaise; that it came from the Indies, on account of its similarity to the milch cows in the neighborhood of Bordeaux, which are supposed to have had such an origin, &c. The best authorities, however, agree that the race Bordelaise, as this race is termed in the neighborhood of Bordeaux, and which resemble the Hollandaise race, is nothing but the race Bretonne more developed by means of more abundant and substantial food.

Characteristics.—The ancient race Bretonne is pie-black or black in color. The cow may be described as having a black snout, sometimes mottled, rarely white, while the membrane which surrounds the tongue is always white, which is distinguishing mark. Taken altogether the animals of this breed would be classed as follows: Thick set, often found measuring at the withers from 3 feet 2 inches to 3 feet 6 inches;

eye bright; head short, fine, and small; horns ordinarily fine and white at the base, are black at the extremities, varying, however, and are sometimes black or yellow, or entirely black throughout, which latter type of horns is greatly esteemed; they also vary in length and size, the shorthorns being preferred. This cow is long from the shoulder to the buttocks compared with its height, and has short and small neck and little ears, the head perfectly detached; little or no dewlap is noticeable; the withers and back are on the same line; some have these parts large, but they are often projecting; above all, the mammillary veins are large and flexible, and no French race presents more marked type of good milkers.

CARE OF CATTLE IN BRITTANY.

This race is so neglected in its home that it might be almost said to provide for itself. The bulls are few and young and the cows are brought to the nearest.

These cows have no especial care; during the winter they have some hay or straw given them in the morning, before they are sent out upon meager pastures to obtain the complement of their rations; while exposed to cold for many hours, they receive scarcely enough sustenance to preserve life. It is from this cause that the breed is in such a lean condition, while it is proof positive that its native qualities must be very substantial to bear up under such treatment.

The ox of this breed passes through many hands usually before he reaches the butcher. His first owner usually keeps him until he is about two and a half years old, then sells him to another, who works him for about the same length of time. At the age of five to six years this lean animal is sold to another, who endeavors for about two months to put him in flesh, and then he passes into the hands of a fourth, and not unfrequently to a fifth, before he is ready for his last trip, which is to the fair. It would be difficult to push division of labor farther.

In their home it is rare to find these cattle in good condition, but this is a necessary consequence of scanty food; but careful observation shows that the bony system is slightly developed, and that they can be readily and profitably fattened. The weight of the cow of this breed is from 330 to 440 pounds, and an ox from 550 to 770 pounds.

THE BRITTANY COW AS A MILKER.

The average quantity of milk is from 1,460 liters to 1,825 liters (1,542 to 1,928 quarts); that is to say, an average of from 4 to 5 liters (4 $\frac{3}{4}$ to 5 $\frac{3}{4}$ quarts) per day. Considering the size of the animal, its usual scanty fare, it must be considered as a good return. The farmers of Morbihan, when asked whether their cows are good, reply, "This one gives 4 pounds, that one 6 pounds, and the other 7 pounds." They mean that such a cow gives such an amount of butter per week.

IMPROVEMENT OF THE BRITTANY BREED.

The attempt has been made to improve this breed by crossing with the Durham and Ayrshire; the result in the former case was good, increasing the weight and precocity of the animal, but without an equally happy result in regard to milking qualities; while the product in the latter case resulted only in producing a less quiet race, of a little larger size and not as good for milk.

The only remedy seems to be in selection, and the amelioration of this breed seems closely connected with the agricultural amelioration

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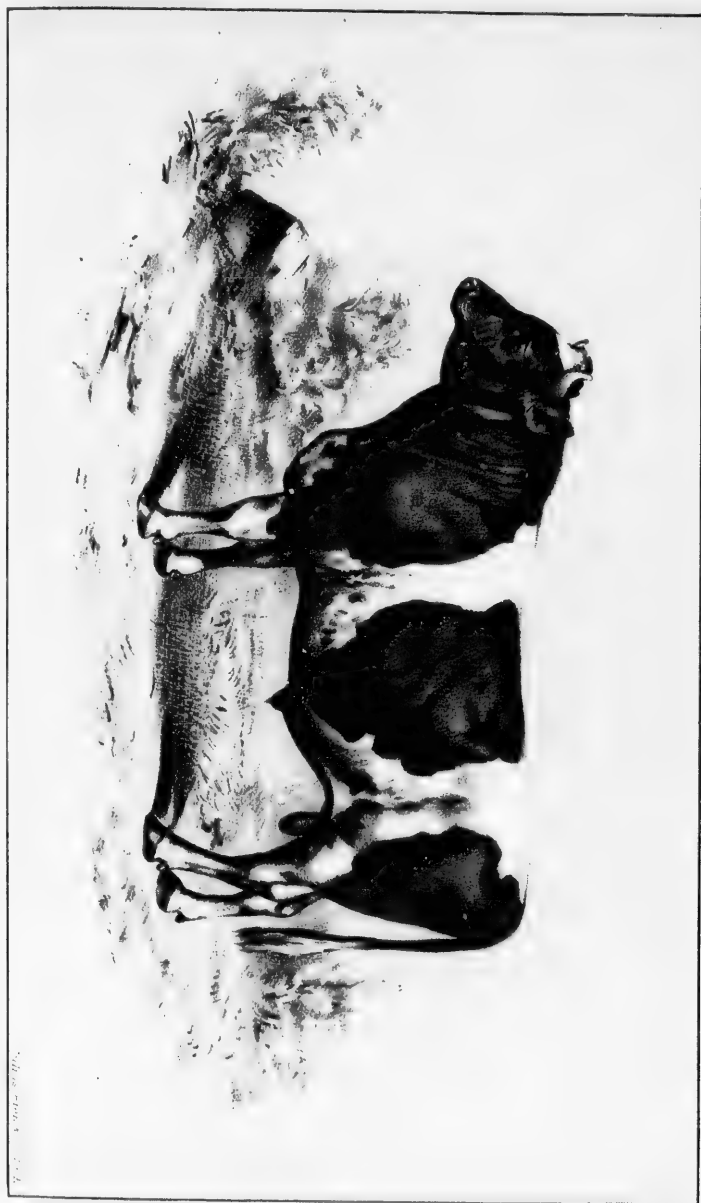
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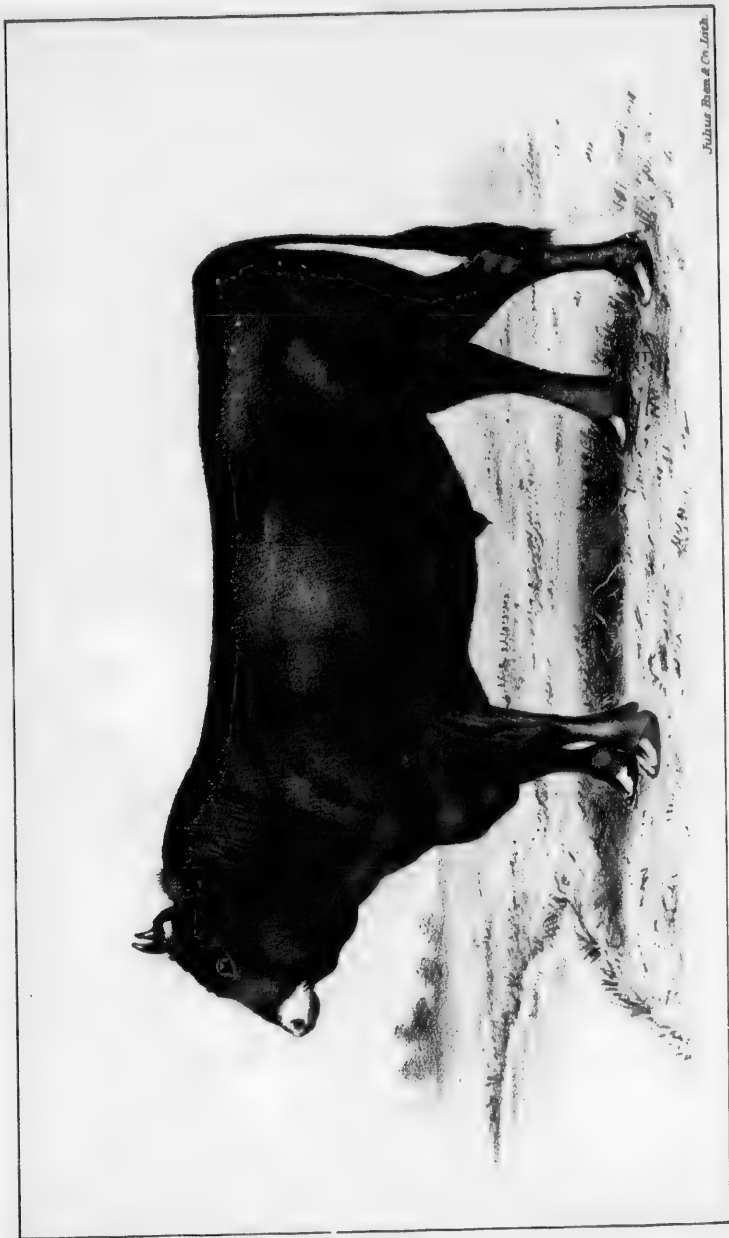


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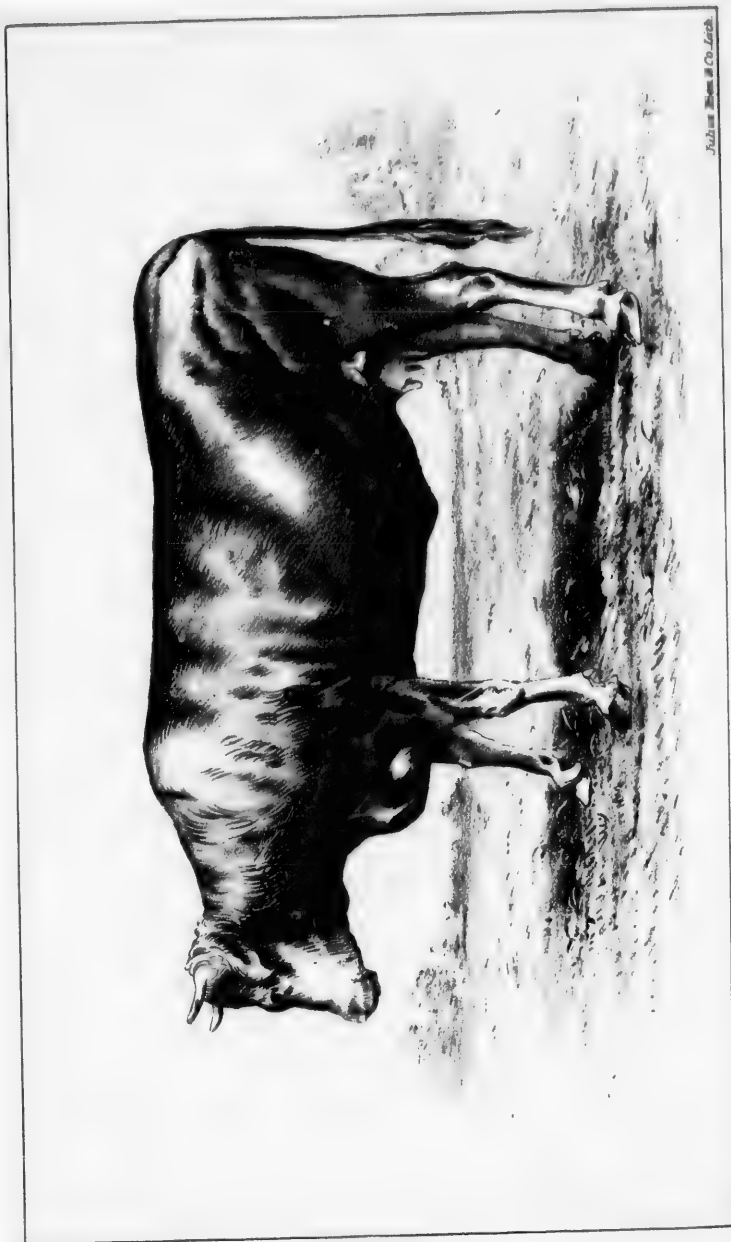


Julius Rose & Co. Lith.

PARTHENAISE BULL

PARTHENAISE BULL





Published by J. B. Baillière & Co. London

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THE PARTHENAISE BREED.

The name of "race Parthenaise" is applied to designate the different varieties of a perfectly homogeneous breed found upon the shores of the ocean from the mouth of the Loire to that of the Gironde.

These varieties assume different names in different localities, and present modifications peculiar to the nature of the soil, treatment, and other economical conditions, without altering the general characteristics of the race.

In the Loire Inférieure they are called "race Nantaise;" in Poitou, "race Poitevine;" in the neighborhood of Cholet, "Choletaise;" "Vendéenne" in the Vendé; "Gatinaise" or "Bocage" in the country known under the name of Gatine or Bocage; and, lastly, "Maraichine" on the shores of the ocean and the marshes of Saintonge. But the parent stock is that raised in Bocage, an extension of the granite reef which forms the greater part of the peninsular of Bretagne, extending along Bocage and the most wooded parts of the west.

CHARACTERISTICS OF THE PARTHENAISE BREED.

The breed of Parthenay has a large and flat forehead, short head, the chausse straight and snout large; the horns are long and tapering, white at the base and black at the extremities; the neck is short and muscular, the dewlap of moderate size, a little thick; shoulders long and muscular; withers long and low; chest deep; ribs often flat and low; line of the back straight; loins large; haunches wide apart; croup horizontal and well furnished with muscles; tail deep set; thighs well muscled and straight; form nearly a square with the projection of the haunches; limbs are short but strong, at the joints large, but very straight. The animals of this breed are heavy, slow, but tenacious, robust, and good workers. The ordinary size varies from 5 feet 9 inches to 5 feet 11 inches. When fattened they readily attain 1,100 pounds, live weight. Their skin is nearly as fine and soft as that of the little race Bretonne, and indicates their aptitude for fattening. The only color admitted for these animals is yellowish brown, slightly varied, as it is sometimes paler, and again approaches claret color. The young animals at birth are brown, which changes as they develop into a lighter tint.

THE PARTHENAISE AS MILKERS AND MEAT CATTLE.

The cattle of this breed, under the names of "Choletins," "Nantais," or "Parthenais," contribute largely to the supply of the city of Paris, and vary in weight, according to age, &c., from 1,750 to 2,250 pounds.

The race is not precocious, but at the abattoirs of Paris butchers told me that they preferred them to the more precocious breeds. The cows

of this breed are smaller in size. The cows in some parts are consigned entirely to the duties of maternity, and the least possible amount for the use of the household is alone taken from it. There are found, however, among them some good milkers, notably of the variety Maraichine. The net returns of the product of meat are more than average; the quality is fine, and the capacity for work constitute this race among the first rank of the French breeds.

THE CHAROLAISE BREED.

The race Charolaise is justly regarded as one of the most important races of France. It is precocious, vigorous in work, and excellent for meat. The cow has never been remarkable for its milking qualities. The name given to this breed of "Charolais" or "Nivernais-Charolais" is identified with the name of the place of its origin, and "Nivernais" perpetuates the name of the department where this race to-day has its center of development, and where the finishing touches have been put upon it.

The Charolais has been termed the Durham of the French race, and it has in a less developed degree the prominent characteristics of that breed, so that a description of that well-known breed would answer for this one. The same lightness of head, fine skin, large haunches, straight line of back, and short legs are found in the one as in the other. In the Durham, however, the bones are small, the legs are slim, and the animal is totally unfit for work, while the Charolais, of firmer bones and strong legs, is well fitted for the work. The Charolais, is at the same time suitable for work and valuable for the butcher. Finally, the Durham demands abundant and substantial nourishment and permanent stabling, while the Charolais, in contrast, is far more hardy, lives and thrives upon herbage, and is only stabled during the most inclement portion of the season. Nevertheless there exists an affinity between these two races which assures success in crossing them, but only in increased precocity in fattening.

The breeding with Herefords proved a failure, injuring their qualities for work, and rendering them more exacting in quality and quantity of food, and on the whole less robust. A constitution of resisting contagious diseases is peculiar to this breed. The cows fatten more readily than the oxen. These cattle are brought into this region in large numbers to fit for the butcher.

THE LIMOUSINE BREED.

Those who have examined the race Limousine in Limousin attest the wonderful change that intelligently directed care has effected in the amelioration of this breed. At the recent fair at Paris, where I counted 47 cattle of this breed among a total of 332, they compared favorably with any on exhibition, and the butchers said that the net returns of meat were very large, being from 66 to 69 per cent.

The Limousines of the mountains are, on the contrary, of small size, hardy, and yield at the abattoirs only moderate returns. It is said of the cattle, as of the inhabitants, that destiny impels them to emigrate. Emigration has caused the improvement. The Limousin ox has a yellow coat, paler on the inner side of the limbs; large yellow horns, which describe a semicircle; large, bright, mild eyes; moderate-sized head, the neck well proportioned to the rest of the body, the dewlaps falling nearly to the ground; haunches well formed; flank low; thighs round;

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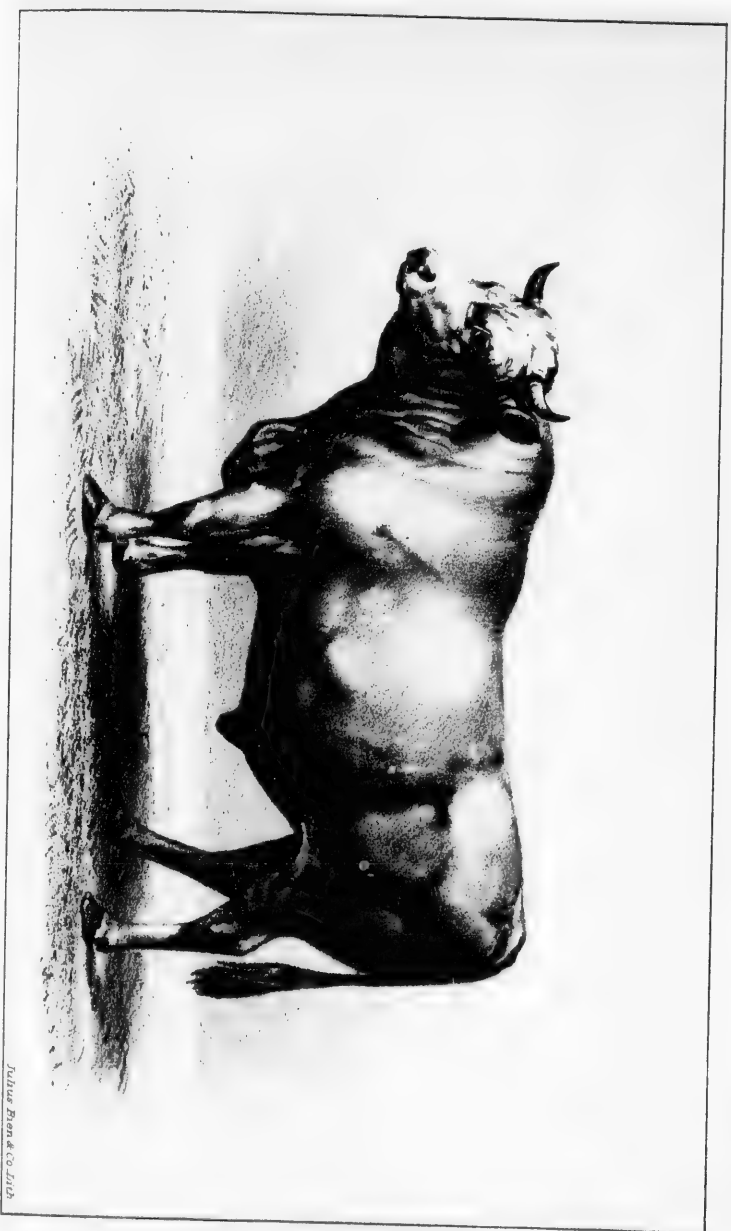
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CHAROLAISE COW



PLATE 9

CHAROLAISE BULL



CHAROLAISE BULL

Julius P. Smith Co. Ltd.

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CHAROLAISE OX

Wm. Fox & Co. Lith.

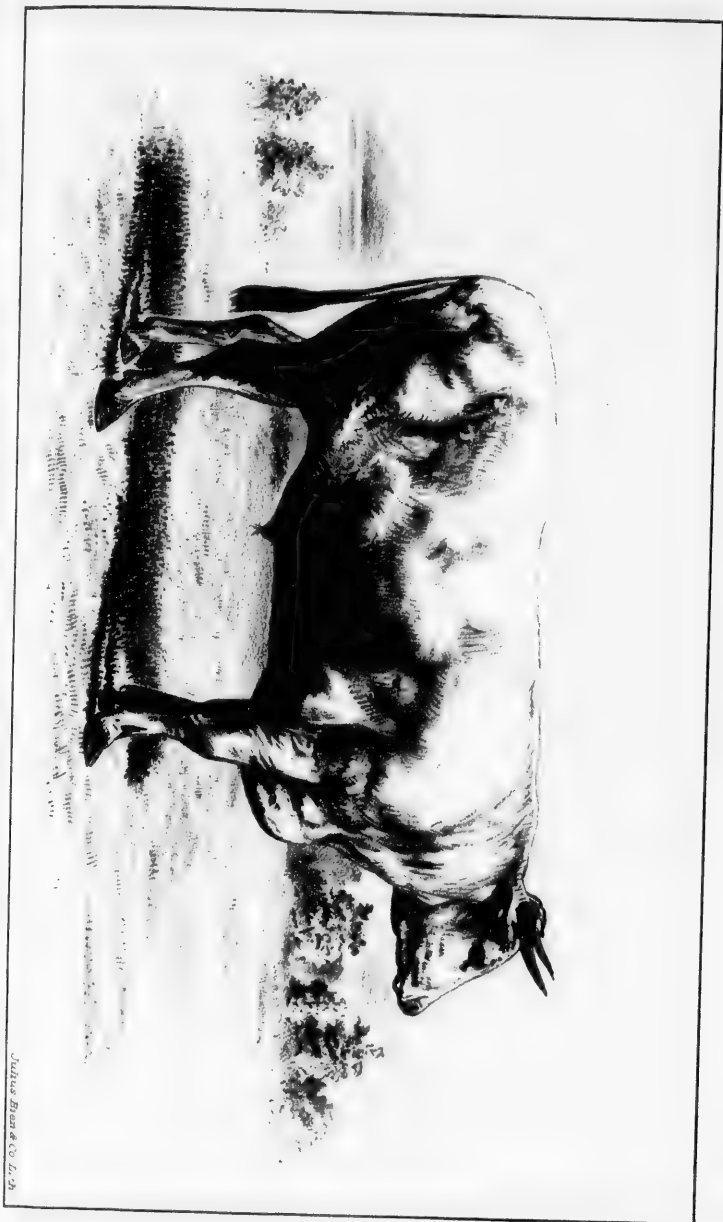
A PRIZE CHAROLAISE QX 4 YEARS 10 MONTHS OLD



Julius Riemer & Co. Lith.

A PRIZE CHAROLAISE OX 4 YEARS 10 MONTHS OLD

"A PRIZE DURHAM-CHAROLAISE OX 3 YEARS 10 MONTHS OLD.



Julius Ross & Co. L.S.

A PRIZE DURHAM-CHAROLAISE OX, 3 YEARS, 10 MONTHS OLD.

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DURHAM-MANCELE PRIZE OX





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shin large; good foot; good gait and easy movement. Their docility is very great and highly prized. They walk slowly and husband their strength while they do their work. The cow is much smaller than the ox, and is remarkably feminine and very fine in limbs. The head is expressive. She has great energy and works more briskly than the ox, but lacks his endurance.

The difference of size between the ox and cow of this breed is easily explained by reasons which I gave above. The cow remains in her home in her original state, while the young ox at the age of twelve or fifteen months is taken into the rich and highly cultivated portions of the country. He receives better and more substantial food; his native qualities are developed; the animal grows and thrives under the better surroundings. The mild treatment and painstaking of the driver insures the docility of the oxen. They are seldom strained; and as the farmer expects the greatest return from the growth and increase of weight of his cattle, it is not unusual to see a cart drawn by three or four pairs of oxen which could be moved by one pair.

The cows work in their homes in the mountains, and are able to turn up the light soil upon which are raised rye and buckwheat. She is only a moderate milker, not equal to those of the breed de Salers, occupying the neighboring mountains. Some attempts have been made to improve this breed by crossing with the Durham, the Charolais, and Gascon. The result of the former was generally good, but less aptitude for work, and with the others occasioned loss of that docility which is of great value to the pure breed.

THE MANCELLE BREED.

The race Mancelle is destined to disappear. The pure breed is only found among some poor farmers, and then of an inferior type. It is difficult to study the pure breed, and scarcely interesting or instructive. I have succeeded in obtaining a cut of this race. Although capable of work, they are rather classed as ordinary workers. The Norman graziers said that they often turned them into their pastures long after the others, but they were the soonest fitted for the market of the capital.

A short cut was discovered to utilize this race by developing it and at the same time exterminating it, or rather substituting for it a superior breed.

The early attempts to introduce the Durham blood to ameliorate this race were so successful, and the transformation so great, that it may be considered as a great stride in advancing the value of French cattle. The "Durham-Manceaux," as this breed is termed, has increased the precocity and propensity for fattening to a degree (as claimed by many) of superiority to all other cattle of native or crossed breeds. However this may be, from the study of these animals, which were very numerous at the recent annual exhibition of animals for the butchery, as well as among the most successful breeders and fatteners of cattle, the fusion of these two bloods has produced excellent results, such as increased precocity, lighter bones, more developed fleshy parts, fuller chest, while diminishing the belly and rendering the ribs more cylindrical; the neck becomes shortened and the head finer. The Durham blood can also be successfully renewed in the Durham-Manceaux, and with such happy results and direct proof as the list of prizes taken by these cattle for many years attest.

The returns of net meat from the Durham-Manceaux is large, varying from 65 to 72 per cent., weight from 2,100 to 2,400 pounds, at three

years ten months of age. The Durham-Manceaux must be considered one of the most valuable breeds which France possesses for food.

THE COMTOISE BREED.

Among the many mixed races of the northeast of France is found a fixed and numerous breed named the "race Comtoise." These have three different varieties, known as "Tourache," "Femeline," and "Bressane." They occupy the mountainous parts of the east of France, from the Vosges to the Alps, the valleys of the basin of the Saone, and the department of Ain.

The variety Tourache tends to disappear. Its continual mixture with the Swiss races serves daily to efface the type more and more. The proprietors of the rich pasturages of the Jura have long been in the habit of loaning to the Swiss 4,000 to 5,000 cows for the summer season, at \$10 per head. This periodical emigration has been the means of infusing much Swiss blood into the pure breed. This renders the study of this variety useless. In the local fairs the three varieties are classed together as Comtoise, although, for reasons shown above, the Tourache is fast disappearing; the Bressane is formed of variable elements; the Femeline alone presents a satisfactory type of a race.

THE FEMELINE BREED.

The race Femeline has a light brown coat, head small and narrow, eyes set near the horns, soft and mild air, fine horns, slim neck, small ears, small dewlap, fine limbs, the ribs well rounded, bones sufficiently light, skin thin and loose at the shoulder, which indicates an aptitude for fattening. The Femeline ox is docile, quick in his movements, has a fair aptness for fattening, and is a favorite with the butchers.

The husbandman keeps his oxen till seven or eight years of age, then puts them in the stables for three or four months, and partially fattens them by feeding them with the after-grass, potatoes, and turnips, cooked and mixed with rye flour, maize, and even with wheat of inferior quality, diluted in water; he also gives them some rape-seed cakes. He then sells them to drovers, who supply Lyons, Côte d'Or, and even Paris. The figures of these annual sales are from 8,000 to 10,000 animals, at an average price of about \$80 per head. Their weight is from 660 to 880 pounds, and the percentage of net meat often rises to 60. Although a good breed and superior in milking qualities to the Charolaise, the latter scarcely giving enough to sustain its calf, the ox Femeline cannot be compared to the Charolaise, with or without the Durham mixture, for in the Durham-Charolaise it is difficult to ascertain where the blood of the Durham begins and that of the Charolais ends.

The variety Bressane is a coarse specimen of the race Comtoise; has its merits as an excellent animal for work, and when even quite old, before it is fattened, is still sought for by the butchers, its flesh being very savory and esteemed in the market of Lyons.

In the annual exhibitions of France this variety Bressane has often taken the prizes, and I herewith insert a cut of one of these prize animals.

THE SALERS BREED.

The race de Salers is one of the oldest in France. It has always been held in good repute. This breed presents the three qualifications desired, but seldom united in the same animal—aptness for work and

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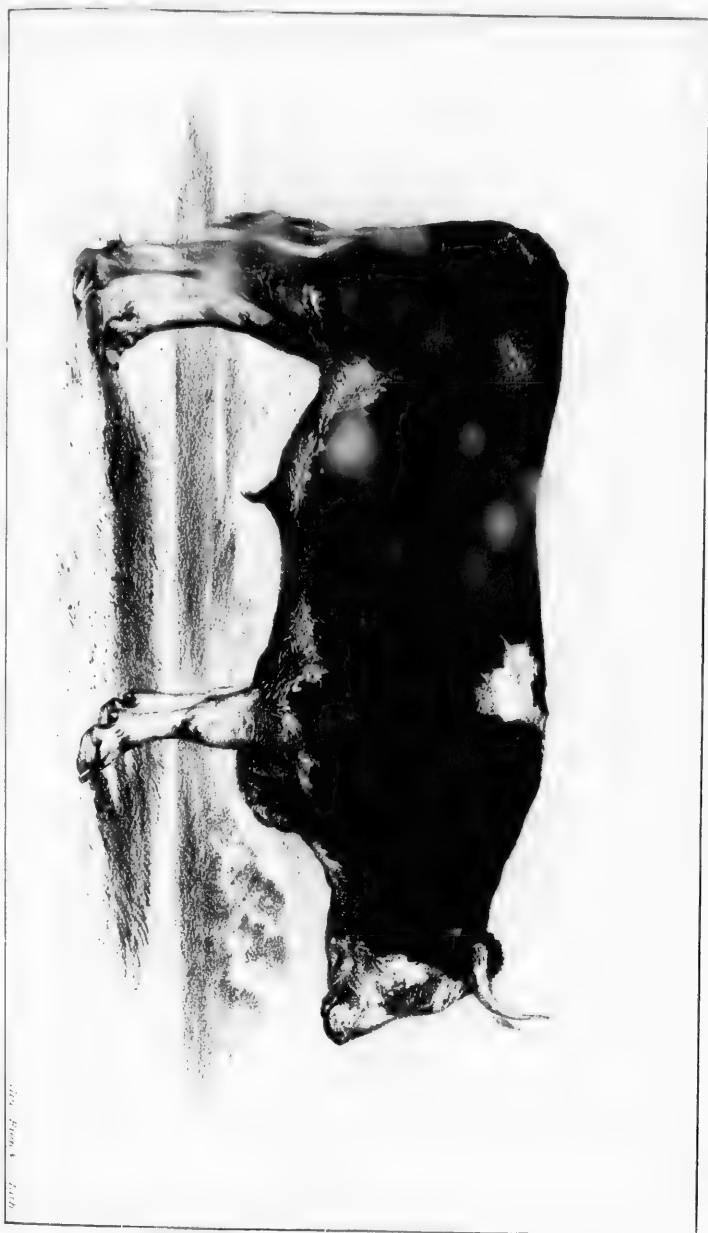
COMTOISE COW



COMTOISE PRIZE OX

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COMTOISE PRIZE OX



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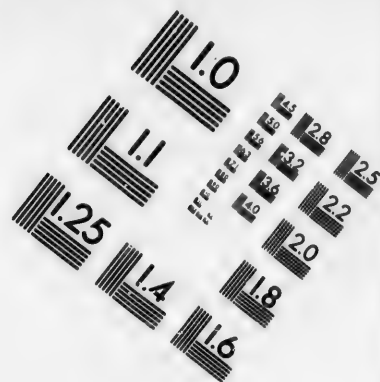
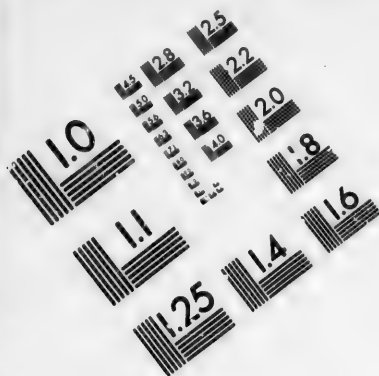
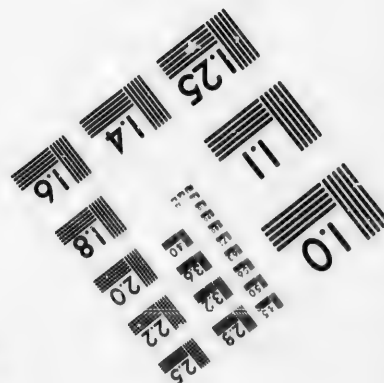
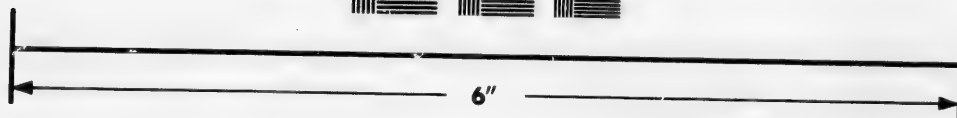
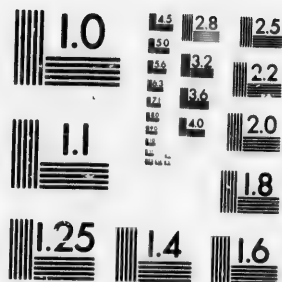


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FEMELINE BULL



Edwin Booth & Co. Lith.

FEMELINE BULL



SALE'S BULL

Johannes Pien & Co. Ltd.



Julius Rosen & Co. Lith.

SALEM'S BULL

SALERS COW AND CALF

Julius Bean & Co. Inc.



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fattening joined to good milking qualities. Besides, it is intelligent and docile. Briefly described, it is from 4 feet 2 inches to 4 feet 6 inches size; live weight, 1,750 to 2,250 pounds; fine, soft, shiny coat, generally red, without spots; fine, supple skin, loose from the ribs; long, slim horns, ordinarily white, wide apart, shooting upwards and backwards toward the end; short head; large forehead; bright, mild eye; good-sized neck; dewlap is moderate; shoulders strong and chest well developed; limbs muscular, fairly strong; are lusty, vigorous, and straight, so formed as to insure a brisk gait; the Salers is often observed trotting like a horse; his body is thick-set and his belly well developed. The name is derived from the little city of Salers, district of Mauriac, situated in the midst of the mountains of Cantal.

Although they occupy a small territory, they manage to export many of these cattle. The oxen are first sold to the neighboring departments for work, and finally they are sold to those who fatten them and thence to Paris. The cows emigrate south and are sought for dairy purposes. At the recent fair for animals for food at Paris the race de Salers, as usual, was well represented. Many of these cattle attain great weight, at the age of five years often running from 2,000 to 2,700 pounds.

The heifers, as remarked, are sold to the south of France, enough only being reserved to replace the superannuated cows of the dairy; others, again, are sold in pairs for working cows.

DAIRYING ON THE CANTAL MOUNTAINS.

A dairy in this part of France consists of about 35 cows, varying however from 20 to 100 cows each. A certain amount of mountain pasturage is required for this dairy. These domains upon the mountains contain 800 acres or more and pasture several dairies. The milk is made into cheese—at home in the spring and fall, when the cows are on the farms, and on the mountains when the cows repair there during the summer. The mountain is utilized as a pasture as long as possible; then the cows descend to the farm and live upon the late vegetation. This devoured, they go into winter quarters in the stables. The pasturage of the mountains is gauged by the number of head it can feed. They say a mountain of 40, 50, or 100 head, to express that the same number of cows or their equivalent can be kept during a certain time. A three-year-old ox or cow or 2 yearlings represent a head; three animals of two years old represent a head; a mare and colt represent two head. The young calves with the cows are not counted. This computation is admitted and has the sanction of the law in case of dispute. The area per head upon the mountains of Salers, where the herbage is thick and rich, is $1\frac{1}{2}$ acres; another claims it requires $2\frac{1}{2}$ acres and even more per head. The cost of this mountain pasturage is from \$6 to \$8 per head for the season. In Auvergne, and especially Salers, these mountains are carefully tended, and are watered as well as possible. They spread the cattle droppings and break down the mole-hills, and close a certain portion each year. When required, drainage is employed, and the pasture is never too closely fed. The herdsmen lead the cows to a dry place for rest at night, and these places are changed every few days. Portions of the pasture well-sprinkled and cared for afford great relief to the cows, which are driven two or three times each day.

The cows ascend the mountain on the 25th May; this is fixed and would require a convention to change. Their time of departure depends upon how much food is at the farm; the 1st of October is about the usual time of descent to the farm. Compared with the Flamandes

and Normandes cows, which give 2,500 quarts of milk per year, the cow of the Salers is rated as a moderate milker; but this inferiority does not apply to the whole race, for in Auvergne, as in Normandy, and in the north, we find cows which give 3,000 quarts.

The average of the dairies of Auvergne is at 1,500 quarts, or thereabout, per head. This is less than with the two before-mentioned races, but the difference is equally great in the consumption of food. Indeed, in Cantal the annual food of a cow consists of grass in pasture for eight months of the year, and 18 or 20 pounds of hay for the rest of the time, while in Normandy and the north the cows are always gorged to repletion with a variety of food, and at a cost of three times that of the cows of Cantal, so that for the same amount of food the cow of Salers gives a greater return of milk. The milk of the cow of Salers is very rich and well adapted to making cheese.

CANTAL CHEESE.

Cheese-making is general and well managed in the mountains of Auvergne. This cheese is known throughout France as "Cantal cheese." Its manufacture is so simple that I have ventured to insert it.

The milk is curdled by pressure in large vats, without skimming. The curd is then strained through a straining bag of white bolting cloth, kneaded, salted, and pressed. The whey, still containing some particles of butter and cheese, is mixed with milk, which causes the cream to rise. From this butter is churned. The cheesy particles remaining after the churning are utilized for making a common cheese, consumed in the locality. The whey remaining after the last process, not being considered too rich, is given to the hogs. A Salers cow produces from 8 to 12 quarts of milk per day, while an occasional one is found giving 25 quarts. About 11,000,000 pounds of cheese are annually made in this region, an average of about 410 pounds per cow. The best dairies turn out 440 pounds per head, inferior ones 220 pounds. In the spring it requires 1,000 to 1,100 quarts of milk for 100 kilograms (220 pounds) of cheese, but as the season advances the richness of the milk in cheese increases. In the fall it again requires 600 quarts of milk for 100 kilograms (220 pounds) of cheese. An average for the year would be about the latter figure. This same milk produces besides from 15½ to 18 pounds of butter. This cheese is sold to the merchants at about 10 cents per pound. This price corresponds to about 6½ cents per quart for milk. In Normandy and the north the milk of which the butter is made gives only a return of about 4 cents per quart.

This difference of price probably indicates the difference in the quality of the milk of the two breeds. This cheese is mostly consumed in Limousin and the south of France, and, though not sought for by the epicures, is palatable and nourishing. It is claimed that the "race de Salers" is less important in a dairy point of view than in furnishing working cattle and food.

THE SALERS CROSS-BREEDS.

The cross-breeding has been tried with the English races of Durham, Devon, the Scotch breed of West Highland, and the Swiss races. The animals of the cross-breed of the Durham at the late exhibition at Paris indicated a slightly greater precocity, but the general verdict of those who have carefully examined the subject is that the crossing has not ameliorated the race, and that this can only be effected by a careful selection of breeding animals taken from the admirable race itself.

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RACE D'AUBRAC.

Although I have not so classified it, it seems proper that the race d'Aubrac, having the fixed characteristics of a distinct race, and although neighbor to the race de Salers and bearing a resemblance to that race, should not be confounded with it. One of the most marked peculiarities of this breed consists in its short legs, out of proportion to its long, thick body, characteristic, however, of all the animals of this region, not excepting the human race. The race d'Aubrac has a good head, fair size, the snout long and large, strong horns, gracefully turned and twisted and of moderate length.

The d'Aubrac cow has a handsome velvety coat and flexible skin, the chest large, the back flat, the bones of the hanches rounded and slightly prominent. The color of the coat is rarely simple, but mixed with clouded tints. The ordinary colors are fawn, hare tint or badger, and soot black, mixed with black and gray.

The ox of this breed attains its growth very slowly. This is not surprising, considering how those animals intended exclusively for work are brought up. But this want of precocity does not apply to all of the race, since some magnificent Aubrac cattle evince remarkable precocity. To obtain this condition the animal must be well fed from the time that it is weaned.

DAIRYING IN AVEYRON.

The cow of Aubrac, like those of most of the southern breeds, is smaller than the male. It is not a great milker, under favorable circumstances giving but 9 or 10 quarts of milk per day. The cheese-making is nevertheless extensively carried on in these mountainous regions. The cheese is deemed superior to that of Holland, but will not keep so long, as the whey is more carefully removed from the latter.

The same establishment of mountain dairies as found in Salers exists in Aveyron. Each dairy of one hundred cows has a head of the cheese-house, to whom \$24 is paid; a boy especially in charge of the calves, at half price; three herdsmen, at \$16 each, which makes a total of \$84 wages for a herd of one hundred cows. The wages are paid at the end of the season, out of the product. These employés are fed on milk, rye bread, and salt bacon; this food is estimated at \$28. The capital of an establishment of this kind is about \$200, besides shifting fences for inclosing the cattle at night, and dairy utensils and cheese on hand, which never exceed \$100. The average yield of an Aubrac cow is 140 pounds cheese and 7 pounds butter.

THE AUBRAC MEAT-OX.

The butcher's stall is the end of the ox of Aubrac, as of all the rest of the oxen in the world, but as a working animal he gives a good profit for his keeping, and it therefore does not detract from his value that he attains his growth slowly.

THE AUBRAC CROSS-BREEDS.

With this race, as with that of the Salers, the crossing with other breeds has not improved it, except in regard to precocity, and as the animal more than pays his way, it seems no object to obtain this precocity at the expense of diminishing his usefulness as a worker.

THE GARONNE BREED.

The race Agenaise, or Garonnaise, is found in the valley of the Garonne, between Toulouse and Bordeaux, an extent of about 60 leagues.

This is one of the finest, largest, and strongest breeds of France, and well adapted to the portion of the country which it occupies.

CHARACTERISTICS OF THE GARONNAISE.

The oxen of this breed measure 5 feet 8 inches at the withers, and even more, and weigh 2,300 pounds, while the cows only measure 4 feet 8 inches and weigh 770 pounds. This race is not faultless, being considered as having the brisket contracted behind the shoulders, the horns long and pointed towards the ground, and the back hollow. This latter is, however, partially overcome in some animals.

FEEDING IN THE GARONNE.

The animals of the high land are fed with a certain parsimony, while a model style of food is provided for those in the valleys. A constant succession of artificial forage, fresh and green, is afforded from 15th March to the 15th of November. From the 15th of March to the 15th of April green rye is fed and mixed with cut straw. This grain, sown in October on a well manured soil, furnishes at the end of winter a nourishing and healthy food. From the 15th of April to the 1st of May, before the blossoming, barley sown in November and later is fed. From the 1st of May to the 15th of June these grasses are replaced by dry fodder; red clover, green and dry, constitutes a portion of their food.

From the 15th of August, for the clover, a mixture of vetches and oats, sown at intervals, affords refreshing nourishment during the extremely heated season. Towards the middle of August the corn fodder is ready and lasts till the middle of November. The corn is sown in the spring upon the same ground from which the rye and barley had been cut in the spring. Eleven-fortieths of an acre sown in corn will support two cows for two months. This crop is valued at \$3 to \$3.50. The leaves and seeds of millet are utilized. These are carefully gathered, and if the other fodder is sufficient, are not drawn upon till winter. During the four months of winter the main dependence is upon red clover, the Holland clover straw, and hay; but few roots are cultivated in this part of France for fodder.

THE GARONNAIS OX.

The Garonnais ox, of large and solid build, is not only used before the carts of the country, but can be seen at Bordeaux slowly trailing heavily laden carts for the loading and discharge of vessels.

In the way of fattening and early maturity the ox merits attention. At the recent Paris exhibition many could be seen which were precocious and of good size, giving good returns of meat in regard to quality and quantity.

THE GARONNAIS CROSS-BREEDS.

A single cross-breed Garonnais, being Limousin-Garonnais, was exhibited and appeared well. There appears no good reason why these races, both remarkable for working and meat, should not assimilate readily. The best accredited opinion is that the Durham race is descended

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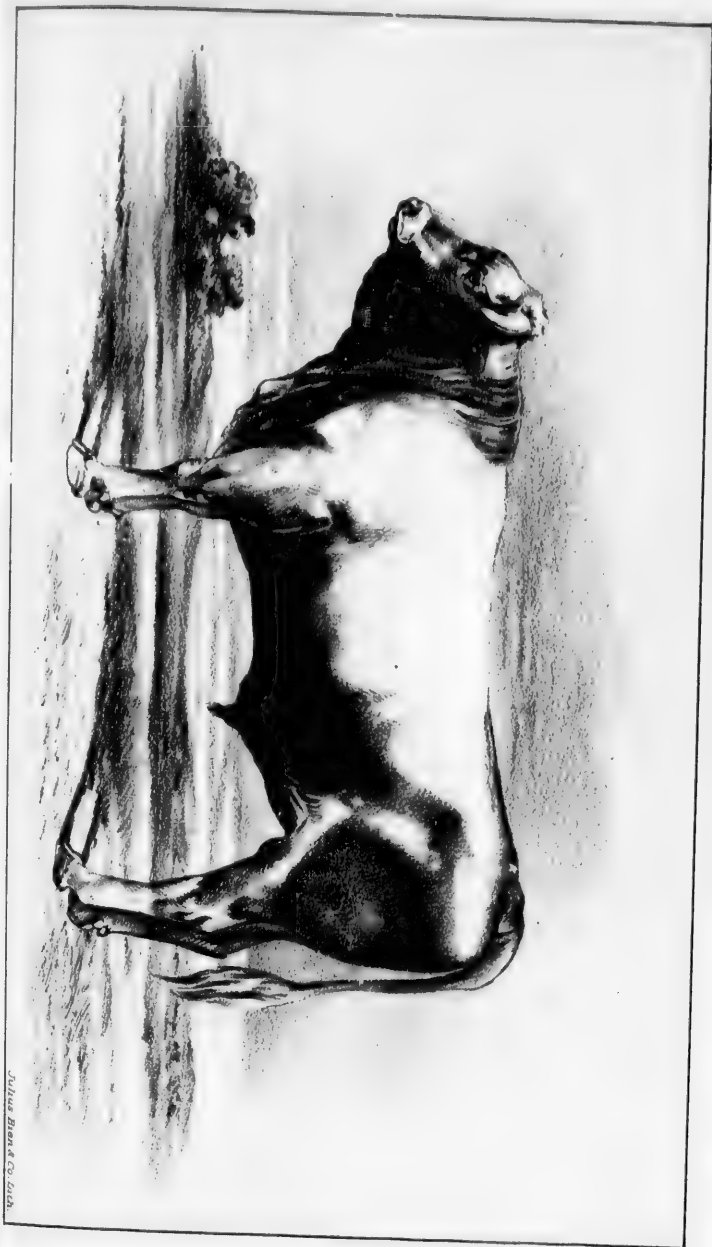
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from the Holland breed, but some claim is made that it came from the race Garonnaise, a large number of which were exported to England. However this may be, there is some foundation in the precocity of the race, which does not equal that of the Durham; but the aim is attended with success to improve this race, and, like the Charolais, Garonnais, and the Durham-Manceaux, to rival the Durham in returns of meat, without impairing their working capacity.

CENSUS OF THE GARONNAIS.

The number of this breed occupying the vast and fertile valley of the Garonne is about 400,000 head, spread over 4,200,000 acres of land. The number of these animals is increasing and their condition sensibly improved from year to year.

THE BAZADAISE BREED.

On approaching the railway station at Langon, between Bordeaux and Bayonne, we invariably see in the summer small clumsy carts, with low wheels, laden with pine wood, and drawn by animals which we recognize with difficulty, on account of their droll trappings, as oxen.

The head, quite large, appears larger in consequence of a species of head-gear made of sheep-skin, which entirely protects it and shades it from the sun in that warm latitude. A sort of shirt of coarse cloth covers closely and protects the animal against the bites of flies and other insects. This curious clothing and intelligent care evince the proper and just appreciation of the inhabitants of the Landes toward the beasts which serve and feed them. There is no occasion there for a society for the protection of animals.

This race derives its name from that of the charming little city of Bazas, in the extremity of the department of the Gironde. The soil about Bazas is more fertile than that in the districts of Mont-de-Marsau and Dux, which explains the difference between the two neighboring races, the race Bazadaise and the race Landaise, although these races have many points of resemblance. The oxen are often submitted to long journeys over paved roads, attached to heavy carts. They toil along these dusty roads under a burning sun, and bear up well under it. The ox-driver takes the best possible care of his cattle, and never strikes them. They march along at their ease; he excites them by words, speeches, and even pleasantries, and a particular song, on hearing which the ox redoubles his efforts.

Farmers and butchers at Bordeaux and Paris are unanimous in their praises of this breed. The superiority of the flesh of the Limousins and Salers is attributable to the fact that these breeds are usually worked very lightly, or about enough to pay for their feed, while the Bazadais does not only agricultural but commercial work. At the south the cows are worked more than the oxen by the farmers. The horse of the Landes is small, light, delicate, excitable, fiery, indefatigable in running about the country, but incapable of working the land or carrying heavy loads. Breton or Boulonnais horses, if substituted, accustomed to good, rich food, would be expensive. Oxen are more convenient, economical, and therefore in general use. The ox, however, fattens easily, and gives a good return of 60 per cent. or more.

There have been few attempts to cross this race, while great strides have been made in their amelioration by selection.

THE LANDAISE BREED.

I have said that the race Bazadaise is often confounded with the race Landaise. It is often crossed thus, but without any advantage, and tending to attenuate the proportions of the animal. The race Landaise, like the Bazadaise, is found in the department of the Landes, and is also subjected to hard work. Agriculture is rude in that department. The animals subsist upon scanty, hard grass. During the winter the working cattle are fed upon hay, the others upon wheat, straw, and corn-stalks. On many farms the cattle are fed by hand. Many wickets are placed in the wall of the house which opens upon the court, surrounded by sheds and stalls, where the animal is free. By these wickets the members of the family in turn give mouthful after mouthful of food to the animals, and with wonderful patience and economy place every mouthful of food in the very gullet of the animal, thus prevented from rejecting it. They are often tempted by the sight of a green leaf, or some appetizing hay tea, or a bit of turnip, but these appearances are often deceitful, and the poor beast is only offered some dry straw which had been untouched in his rack and should have served for a bed.

This method of taking care of an animal takes much time, and makes a great inroad into the night of the workman, whose entire day is taken up in the fields; but it is astonishing with how little feed, of the most ordinary kind, the animals subjected to heavy and incessant labor can be kept in good condition.

The cows, much smaller than the oxen, are subjected to hard work, while they nourish their calves without receiving any additional nourishment themselves.

LANDAISE BULL-RACES.

The agility of these animals is extraordinary; they take a trot without being blown. They are often sent on long routes and make 45 to 50 miles in twenty-four hours, and in making these distances they do not stop for rest. At the fairs in the Landes the agility of these animals is often exhibited; the bulls rarely figure in these games, although they are termed "bull-races." The oxen and cows ordinarily take part in these games. These are less exciting than bull fights, but the greatest enthusiasm is evinced by the crowd, and the same agility and audacity on the part of the actors, who evince a curious knowledge of the ways of the animal, to whom they openly oppose themselves without any other defense than the rapidity of getting out of his way. The skillful athlete, with a cigarette in his mouth, makes a slight movement when the bull advances towards him with his head lowered; the horns graze his breast, but he has closely calculated the distance. As the infuriated animal rushes upon him, with his head lowered to strike him, he coolly places a foot between his horns, and, aided by the upward movement of the animal's head, safely springs behind him. This is not always accomplished without accident, but precaution in the way of cords usually prevent any unpleasant episodes.

THE LANDAISE AS A MEAT CATTLE.

The race Landaise has an established reputation at the annual fairs of fat cattle in France. Upon a hardy race, badly fed in its home, as are the Landais, increased food works wonders; if to this is added a selection of breeding animals you are sure to arrive at the utmost relative perfection of the race. This race, while strongly framed for work,

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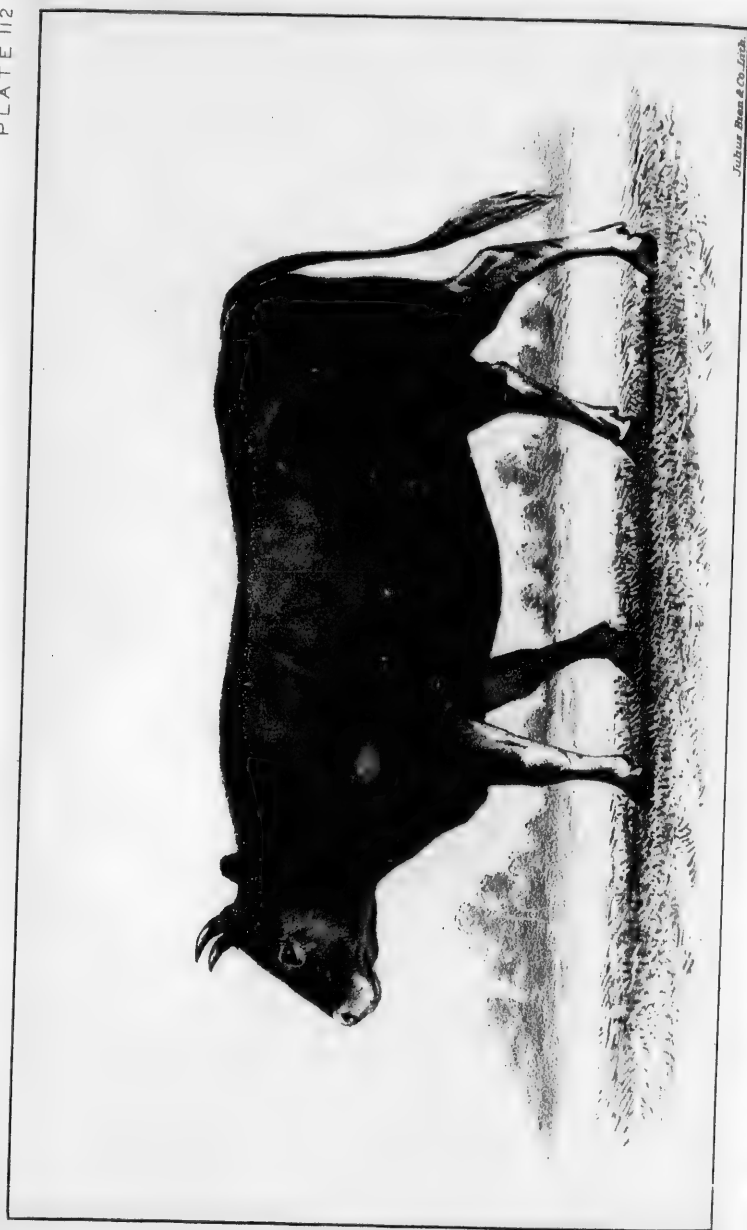
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LANDAISE BULL



J. Muller, St. Louis, Mo.





Julius Benn & Co. Lith.

ALGERIAN COW

Julius Braun & Co. Leipzig.

ALGERIAN COW



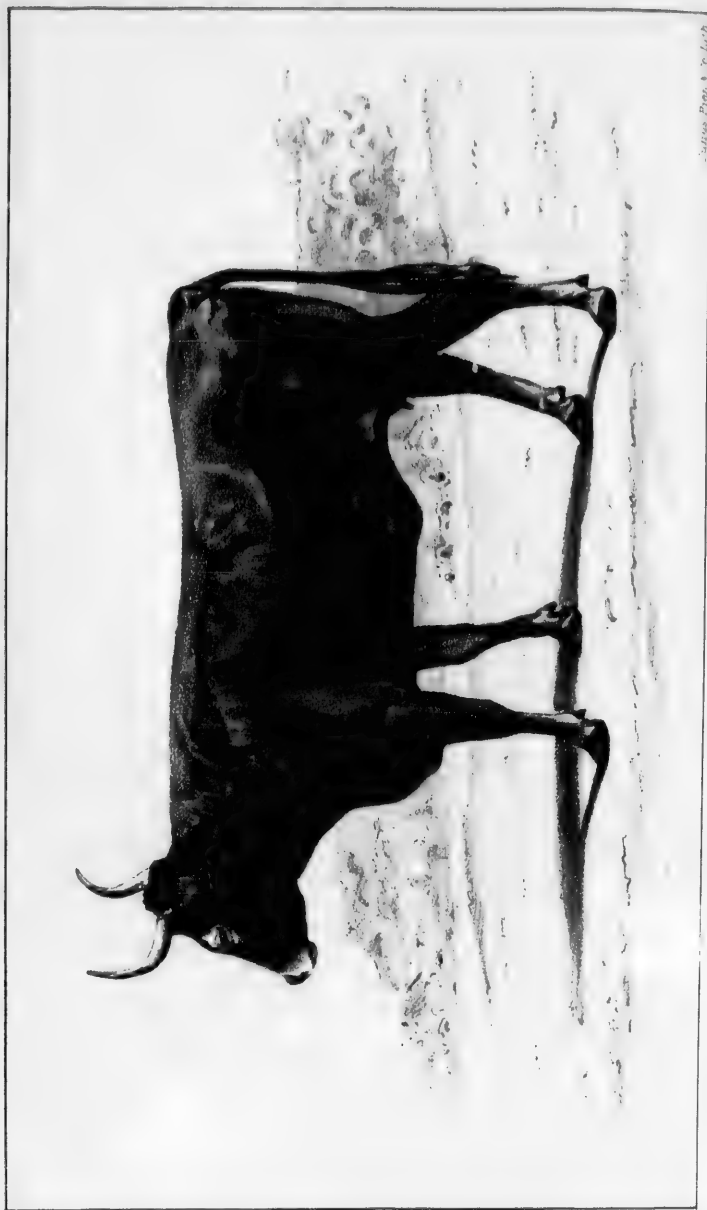


Julius Press & Co. Ltd.

BARETonne BULL

BARETTONNE BULL





James Finck & Co. Ltd.

BEARNAISE COW

BEARNAISE COW



Julius Brann & Co. Lith.

GASCON BULL

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has a small, bony structure, qualifying it for taking flesh. This peculiar bony structure belongs to the race therefore it has been demonstrated; that if these animals are well fed from their birth, they will at an early age return good profit for their keeping for the sole purpose of food.

THE GASCON BREED.

All agree that the race Gasconne is especially adapted to work. Its prominent features are briskness and force for work. It is principally found in the department of Gers, a very broken country, where the cultivation of the hills is difficult and laborious. Its powers are here put to constant proof. Its faults are those of a race given up to work entirely, and that of the hardest kind. The oxen are worked until they are twelve to fifteen years old, and then fitted as well as may be for the butcher.

Compared with the races Bazadaise and Garonnaise it has many traits in common. The race Gasconne is slower and more clumsy, but more vigorous, stiff at work, like the soil it cultivates. The Garonnaise is more precocious. The race Bazadaise is more lively, better adapted to the light soil that it dwells upon, and above all to the fatigue of long journeys, which it bears astonishingly. The cows of this breed are more in number than the oxen and are submitted to very rough work. They are poor milkers, scarcely affording nourishment for their calves.

In that part of France they cook with oil and fat, and there is little demand for butter. Those who wish for milk buy the little Bretonnes which are found in great numbers in the Pyrénées, and from Bordeaux to the eastern limits of the Biscayan country.

There are numerous subraces, considered distinct, notably those coming under the head of Ariégé, but they would scarcely interest those studying the French races from an American point of view.

CATTLE OF THE PYRÉNÉES.

Although it is admitted that there are many varieties, known as "Basquaise," "Barétone," "Landaise," they resemble one another so closely that it would simplify matters much to generalize them as "races des Pyrénées" or races of the Pyrénées. Like all the mountain races, these increase in size when taken to fertile plains. They are not very great milkers, but there are found exceptional cows which give a fair average, but they are more or less uniformly good workers, and can be fattened fairly after their days for labor are over.

ALGERIAN CATTLE.

The race of Algiers is not very generally known, but as stockraisers send yearly a large number of cattle to Marseilles, as well as the interior of France, a brief sketch of this race might not be out of place. The coat is generally brown or mauve, sometimes drab or chestnut, more or less mottled, seldom clear. Its girth varies from 3 feet 9 inches to 4 feet 5 inches. The smaller animals are found in the mountains, the larger in the richer valleys.

Characteristics.—Frame rather large than small; head wants fineness, without being exactly heavy and large; limbs large and firmly attached; horns large and colored, their direction upwards and circular; body short, thick and round; withers thick; sides well arched; chest fair

size; dewlap prominent; flank short; skin smooth, but rather thick than fine; step light and aspect lively; very tractable and of good disposition. On the whole, this description pictures an animal without many faults. The ox is a good worker, tough, energetic, and only needs size and weight.

Care and handling.—It is said of them that they live and thrive where European breeds would languish and die, submitted to the same fare.

In the spring they have abundant feed, but during the rest of the year they live upon dry herbage, sunburnt or injured by the heavy dust, while for drink they only have an insufficient quantity of brackish water. Such is the carelessness of the Arabs that they fail to provide forage for the winter, although the snow sometimes covers the earth for fifteen consecutive days. They do not attempt to protect the cattle from the cold of winter or from the excessive heat of summer, and the cattle, submitted to all the vicissitudes of a variable climate like that of Algiers, endure a deprivation of food more or less complete for nine months of the year. It is not astonishing, therefore, that the mortality of these cattle is great.

The Algerian cow as a milker.—The Algerian cow is a poor milker; gives scarcely milk enough to nourish her calf, which the Arab woman tries to take from her for the household. Only one of the four teats is allowed for the calf. If this cow is a poor milker, as an offset its milk is rich. The Arabs drink it fresh or sour, and make butter and cheese by a barbarous process, a description of which would not be instructive. This race has been crossed with the Schwitz, a native of the center of Switzerland, with happy results, adding to the size and improving the milking qualities. Submitted to a good liberal regimen they have excited attention and admiration, and have yielded as high as 69 per cent. net meat. In 1878 42,250 Algerian cattle were imported into France.

MISCELLANEOUS BREEDS.

This article might be extended to an indefinite length if attempt were made to include many of other breeds and subbreeds, such as the race Tarentaise; the breed of the Black Mountain, termed "race de la Montagne noir;" the race du Gevaudan, found in the department of Herault, of small size, but said to be as old as poverty. I have endeavored to call attention to the more prominent breeds of cattle as seen in their homes, and describing their surroundings, solely in the hope of guiding the intelligent breeder in his search for the type of cattle best adapted to the locality and the ends which he proposes to accomplish by importing the same.

STATISTICS OF LA VILETTE, THE PARIS ABATTOIR.

All of the large cities of France are supplied with abattoirs, or slaughter-houses. The celebrated La Vilette, of Paris, combines the advantages of a cattle market with a slaughter-house; has ample accommodations for housing 5,000 or 6,000 head of cattle, besides calves and sheep. About 5,000 head of oxen are slaughtered here weekly, in addition to the other animals. Upwards of 1,000 men are employed here, and the streets are paved.

There are 64 large buildings, some for the doomed cattle and others used as slaughter-houses. Fountains and tanks abound. These buildings cover about 67 acres, and the whole presents the appearance of a

GEVAUDAN COW

Julius Bien & Co. Lith.



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miniature city. The details of the entire process, from the time that the animal arrives in Paris until the product of meat reaches the consumer and the remainder is utilized, although an interesting and profitable study, scarcely comes within the scope of this article; but I will give, as calculated at Vilette, "the returns of the products of an ox of the average weight of 350 kilograms (770 pounds) and of average quality:

Returns of products.

	France.
Hide, average weight 4½ kilograms, at 1 franc	48.00
Suet, 25 kilograms, at 92 centimes	23.00
Refuse	18.00
Total	89.00

Expenses.

Oetroi, at 12 francs per 100 kilograms	42.00
Bringing from the market to the abattoir	.35
Washing of the tripes	.40
Labor	6.00
Sundry expenses (food, material, &c.)	5.00
Total	53.75
Balance	35.25

Or about 10 francs per 100 kilograms.

This proves that an ox bought in the market for 1.60 francs per kilogram (per pound about 14 cents) costs in the abattoir 1.50 francs per kilogram (per pound about 13 cents).

The variation in the prices of hides and suet may more or less influence the price of the net meat, but the above figures demonstrate in an exact and general way the returns of the products and the cost of the labor and management.

The return of net meat of the animals slaughtered in Paris varies according to the age, the race, the kind of food, and the degree of fatness they have reached.

The returns at Paris are greater, as the journey rids the intestines of excrement.

The net returns from cattle from 3 to 5 years old is found to be proportionally the best. The average return is, for cattle in ordinary condition, from 50 to 55 per cent.; half fattened, 55 to 60 per cent.; fattened, 60 to 65 per cent.; extra fattened, 65 to 70 per cent.

Animals slaughtered in the abattoir général at Paris.

Year.	Oxen.	Calves.	Lambs.	Total.	Year.	Oxen.	Calves.	Lambs.	Total.
1873	161,892	129,698	1,630,615	1,322,175	1878	189,499	183,798	1,431,537	1,786,834
1874	166,579	138,360	1,140,530	1,445,469	1879	198,573	183,777	1,409,129	1,791,479
1875	189,339	162,379	1,238,482	1,590,194	1880	218,080	186,913	1,531,462	1,936,455
1876	194,365	168,943	1,277,726	1,641,234	1881	232,621	192,781	1,573,563	1,998,965
1877	183,190	177,460	1,280,430	1,641,080	1882	239,294	198,473	1,603,123	2,040,780

The above figures, from an authentic source, give an idea of the immense work done in this vast establishment.

The number of animals slaughtered in the abattoirs of Grenelle and Villejuif during the year 1882 was: Oxen, 34,178; calves, 31,970; lambs, 203,843.

This gives the following total of animals slaughtered in Paris in 1882: Oxen, 273,382; calves, 230,443; lambs, 1,806,966.

OCTROI TAXES.

The octroi, or municipal tax, is levied in all cities and villages upon every article of food and drink. Every person who eats and drinks thus becomes a tax-payer.

GRADING MEAT IN LILLE, PARIS, AND LONDON.

The different appreciation of the various cuts of meat in the markets of Lille, Paris, and London is astonishing. The stock-breeders are interested and should familiarize themselves with this question, that they may know what portions of the body they should strive to develop by the judicious choice of breeding animals. In the same animal the market price varies more than half, according to the part of the animal from which it is taken. A pound of the fillet in the subjoined cut, No. 1, fig. 2, and No. 5, fig. 1, are sold at Lille at 41 cents and at Paris at 44 cents per pound, while the portions 13, 14, and 15 scarcely bring 12½ to 14 cents per pound. This distinction is not made in all the cities, but is destined to become general in all large centers of consumption.

The accompanying cuts and tables give a clear idea of the mode of grading beef in Lille, Paris, and London:

Mode of dividing an ox in the abattoirs at Paris.

Quality.	Number of pieces.	Names of pieces.	Weight of each piece of a fat Norman ox, weighing 457 kilograms net (1,007.50 pounds).
			Pounds.
I	1	Veiny piece.....	44.09
	2	Ditch bone.....	69.14
	3	Thick flank.....	44.09
	4	Sirloin.....	110.25
	5	Fillet.....	15.46
	6	Buttock.....	33.67
		Total of first quality.....	313.65
II	7	Shoulder-blades.....	154.32
	8	End of neck.....	41.02
	9	Ribs.....	99.20
		Total of second quality.....	294.54
III	10	Chuck.....	53.12
	11	Neck.....	77.19
	12	Brisket.....	165.34
	13	Leg and shin.....	55.11
	14	Cheek.....	22.04
	15	Inner sirloin.....	22.04
		Kidneys.....	33.19
		Total of third quality.....	429.91
		Total of the three qualities.....	1,007.50

HOW THE PARIS BUTCHERS CUT UP A BEEF

First quality
Intermediate cuts between 1st & 2nd qualities
Second quality
Intermediate cuts between 2nd & 3rd qualities
Third quality

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HOW THE PARIS BUTCHERS CUT UP A BEEF

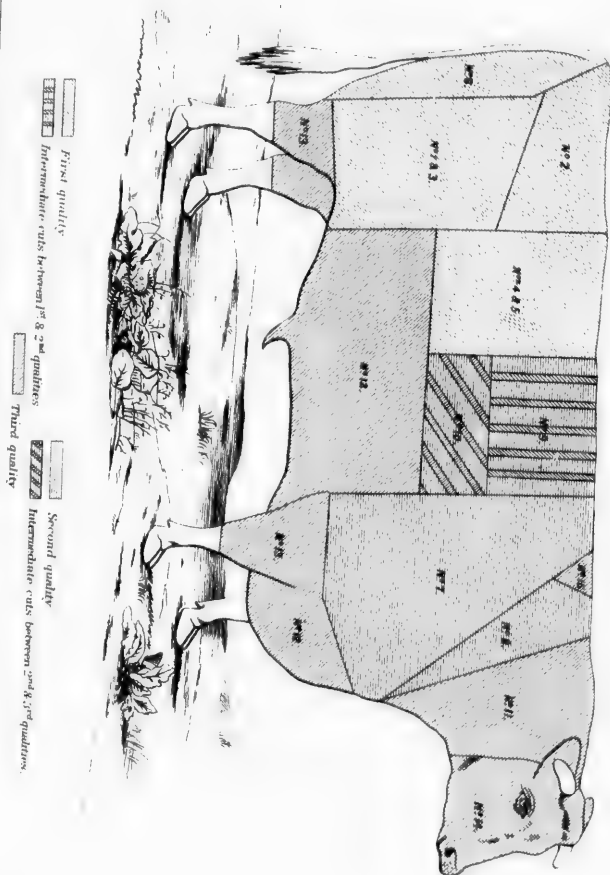
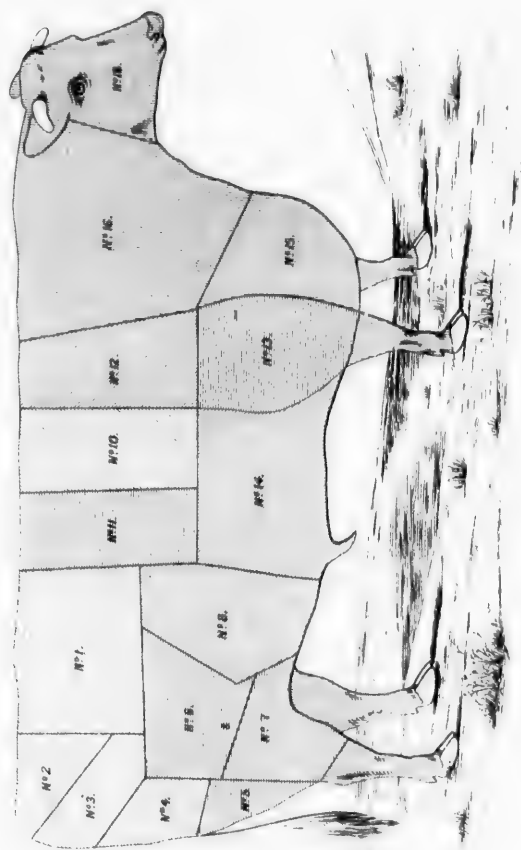


FIG 1

FIG. 2



1st quality
2nd quality

3rd quality
4th quality

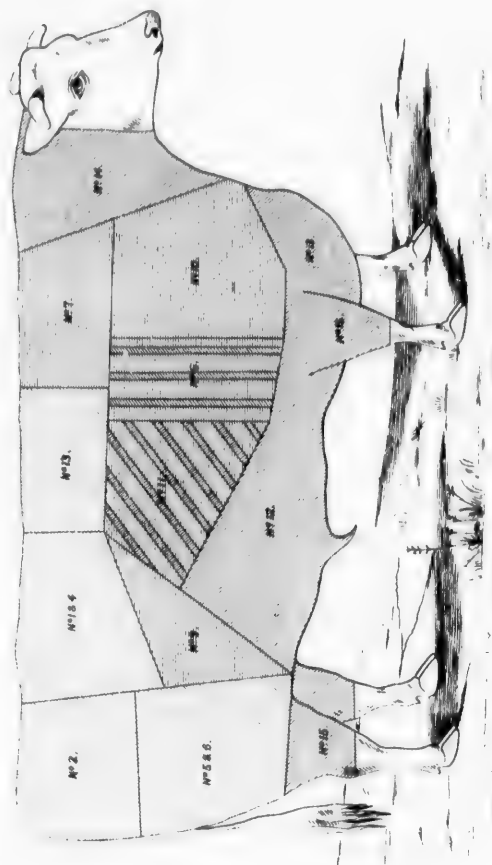
HOW THE LONDON BUTCHERS CUT UP A BEEF

1st quality
2nd quality

3rd quality
4th quality

HOW THE LONDON BUTCHERS CUT UP A BEEF

FIG. 3



First quality
Second quality
Intermediate cuts between first & second qualities
Third quality

HOW THE LITTLE BUTCHERS CUT UP A BEEF

Quality

I ...

II ...

III ...

Quality. Number of pieces

I ...

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FRANCE.

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Mode of dividing an ox in the abattoirs at Lille.

Quality.	Number of pieces.	Names of pieces.	Weight of each piece of a fat Flamand ox, weighing 458 kilograms net (1,009.70 pounds).
I	1	Fillet	<i>Pounds.</i> 15.00 70.54 77.16 61.72 35.27 57.32
	2	Rump	
	3	Ribs	
	4	Sirloin	
	5	Veiny piece	
	6	Thick flank	
Total of first quality			317.01
II	7	Blind ribs sirloin	92.60 59.52 48.50
	8	Mouse buttock	
	9	Piece called "Pi"	
Total of second quality			200.62
III	10	Shoulder	68.13 68.34 92.60 52.91 115.09 462.07
	11	Chuck	
	12	Flank	
	13	Brisket	
	14	Neck	
	15	Leg and shin, &c.	
Total of third quality			1,009.70
Total of the three qualities			

Mode of dividing an ox in the London butcher-stalls.

Quality.	Number of pieces.	Names of pieces.	Weight of each piece of a 4-years of age, ordinary quality, weighing 1,032 pounds, English weight (467 kilograms).
I	1	Sirloin	<i>Pounds.</i> 144 72 32 112 112
	2	Rump	
	3	Butt-bone	
	4	Buttock	
	10	Fore-ribs	
Total of first quality			472
II	6	Veiny piece, and thick flank	56 24 120 48
	7	Mouse buttock	
	11	Middle ribs	
	13	Shoulder	
Total of second quality			248
III	12	Thin flank	72 44 64 40
	14	Chuck	
	15	Brisket	
	16	Clod	
IV	16	Neck	48 44 312
	16	Leg and shin	
	18	Cheek	
Total of third and fourth qualities			1,032
Total of the four qualities			

Second quality

First quality

Third quality

Intermediate cuts, between 2nd & 3rd qualities

Intermediate cuts, between 1st & 2nd qualities

HOW THE LITTLE BUTCHERS CUT UP A BEEF

FOOD CONSUMPTION IN FRANCE.

I give below a table of the ordinary annual consumption of food in the principal cities of France, per capita; also a table of the imports and exports of cattle and their products in France for the last three years:

Cities.	Bread.		Wine.		Fresh meat.
	Kilos.	Liters.	Kilos.	Liters.	
Paris.....	164	224	86		
Lyons.....	175	230	71		
Marseilles.....	244	186	67		
Bordeaux.....	165	210	67		
Lille.....	219	35	49		
Nantes.....	207	162	46		
Toulouse.....	177	176	55		
Rouen.....	183	49	81		

This table demonstrates that the people of Paris consume in average the most wine and the least bread, and those of Lyons the most wine. The inhabitants of Rouen and Lille consume the smallest quantity of wine, owing to the absence of vineyards and the great consumption of cider in the former and of beer in the latter place. The annual consumption of beer in Lille is 213 liters and of cider 124 liters in average.

IMPORT AND EXPORT OF ANIMALS FOR FOOD.

The import and export of animals for food and their products for France during the last three years:

Description.	Import.			Export.		
	1882.	1881.	1880.	1882.	1881.	1880.
Oxen.....head..	77,866	54,133	68,384	39,908	27,531	19,966
Cows.....do....	50,133	44,093	63,431	29,353	30,455	22,350
Fresh meat.....kilograms..	66,285	57,451	73,185	9,182	8,419	5,472
Cheese.....do....	16,056,038	15,638,946	15,790,468	4,439,534	4,076,557	4,267,237
Butter.....do....	6,341,010	7,271,593	7,045,036	38,366,629	30,879,118	31,064,521

MEAT PRICES IN FRANCE.

We have seen that the average price of good marketable beef on foot at Paris is about 32 cents per pound, 28 cents for second class, and 24 cents for third class, while at Rouen the prices are 36 cents, 33 cents, and 30 cents for the same; the latter prices prevail at Lille. There seems no reason why this discrimination should exist to the prejudice of the latter cities, except that no person ever thinks of underselling his neighbor here, and it would be torture to any vender to discover that he had not obtained the highest possible price.

THE FOOD DEFICIT OF FRANCE: WHENCE IMPORTED.

From these tables can be seen that France does not produce its own meat and dairy products, and never can. France is very far from furnishing a good nourishing regimen. The average consumption of meat among the rural population is about 57 pounds per head; in rural dis-

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Pasture feedi scribing the liu different breed in Normandy,

tricts containing more than 1,000 inhabitants, 147 pounds; and 176 pounds in Paris. In England the average consumption of meat per head is about 180 pounds. This estimate of consumption must be still cut down, for it would require upwards of 6,600,000,000 pounds to furnish this quota, but the actual consumption only reaches 2,600,000,000 to 2,800,000,000 pounds, of which about one-tenth is imported. Italy contributes largely of this amount, in the exceptional year of 1878 furnishing to France 72,661 oxen, 41,775 cows, and 230,000 sheep. Algeria, as noted before, gave 42,250 oxen in that year; Belgium furnished 5,000 oxen and 37,000 cows; Switzerland some hundreds of oxen and thousands of cows and sheep; Germany, besides 1,135,000 sheep, sent some hundreds of oxen and thousands of cows. The United States, up to that time, had sent only 659 oxen. Many American cattle find their way through Belgium into France, owing to greater facilities for shipping by the Belgian lines. In regard to the amount of this traffic the information can be furnished by consuls of French ports in regular steam communication with the United States.

A deficiency of the home supply of meat exists in France, yet the Government has been called upon to play the rôle of Providence and become responsible for unfruitful seasons, and is expected to solve the problem of rendering a high price to the farmer for his meat and grain, while furnishing cheap bread to the laborer. A large number of the more intelligent of the population, influenced in some degree, perhaps, by private interests, consider the public consumption of food as limited and incapable of extension, and that increased exertion is alone necessary to supply the home demand. They therefore conclude that the importation of foreign food is directly hostile to the rights of the French producer, and, relatively, curtails labor.

When they prohibit and restrict the free entry of articles of food, they seem oblivious to the fact that, while they can do little more to increase the supply, the ordinary increase of population demands greater supply, and that in cheapening the necessities of life they increase the moral and physical vigor of the workman, and enable the poor consumer to apply the difference to other wants. This policy weighs heavily, and inflicts cruel sufferings every day upon the manufacturing districts and affords no relief to the farmer.

CATTLE-FEEDING IN FRANCE.

Stall feeding.—In the north fattening is done largely in cattle-sheds near sugar-houses, or in dairies near towns. The residue of sugar works, distilleries, and breweries, also oil cakes of oleaginous grains, form the principal base of their diet.

Farinaceous food takes but a secondary place and is only used as an accessory. The pulp of the beet-root takes the principal place in the fattening. It is difficult to form any idea of the enormous quantities of food that the sugar works and distilleries of beet-root afford for fattening purposes.

At present France produces 432,000 tons of sugar, for which it requires 7,987,500 tons of beet-root, one-third of which, 2,662,500 tons, pressed pulp of beets after the saccharine matter is extracted, is used for fattening cattle.

Pasture feeding.—It is said that the scarcity of farm labor is circumscribing the limits of this industry. In the description of many of the different breeds mention was made that pastures abounded especially in Normandy, the north, Charolais, Nivernais, Auvergne, Franche

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Wine.	Fresh meat.
Liters.	Kilos.
224	86
230	71
186	6
210	6
25	49
162	46
178	5
49	61

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Comté, and Vendée. Those of Normandy can be considered the best for fattening purposes.

Nievre and Charolais rank second. The rental of these pastures varies. In Normandy there are three classes or qualities. The first is valued at \$26 per acre; it is estimated that six-tenths of an acre of this land will fatten an ox of 1,200 or 1,300 pounds, live weight. The second-class pastures rent at \$21 per acre, which is considered sufficient to fatten an ox of 1,100 pounds, live weight. The third quality rents for \$19 per acre, and three-fourths of an acre is considered sufficient for fattening an ox of 900 pounds.

FATTENING CATTLE IN FRANCE.

The graziers of Normandy buy at the cattle fairs of Bretagne, Anjou, Maine, Berry, Manche, Touraine, Poitou, and Santonge, towards the last of April, thin cattle of the Breton, Normand, Parthenais, Salers, Mancelle, and mixed Durham breeds. These cattle are turned into the third-class pastures at first, where they rest and refresh themselves. When improvement in their condition is observed they pass successively into the second and first class pastures. One-fourth are ready for sale in three months, or in the month of August; one-half leave the pastures for the market one month later; the last are sent forward in October. The fattening, therefore, takes about four months. Every fat animal sold is replaced by a thin one. When the feed is too short for cattle, sheep take their place, at the rate of two heads for one of cattle. The pasture is thus occupied from the 1st of May until the 15th of November. Milking cows are pastured the same length of time, and are stabled for the rest of the year, and fed on hay, carrots, cabbages, pulp of beets, or brewers' grains; to this is added, in the neighborhood of Lille, to cows in full milk, a mash of pulverized beans or oil-cake. Carrots, parsnips rich in sugar, beet-root, potatoes, artichokes, turnips, and rutabagas constitute the winter food of the cattle. Very little grain is fed.

COST OF FATTENING CATTLE IN FRANCE AND IN THE UNITED STATES.

The French calculate that it costs \$37 per head to fatten cattle in France, and only \$2.40 to \$2.75 in the United States.

HOW TO PURCHASE CATTLE IN FRANCE.

The requirements and deficiencies of this market in regard to meat are evident. A practical man looking over the ground could determine the best manner of importing them, and, as remarked, I am informed that Belgium affords the cheapest entry, and if the cattle are suffered to rest in the rich pastures of that country the benefit would result in pecuniary profit.

With a view of answering the interrogatories contained in the cattle circular, I have endeavored to assist in this effort to increase and ameliorate the native breeds of cattle, which is justly considered one of the most important elements in the general agricultural prosperity of a country. In endeavoring to describe the various breeds of cattle found in France, and delineating the especial value of these breeds in such a manner that the American breeder could determine the advantages, if any, which would follow their introduction, I would merely further add that the only knowledge absolutely essential to one desirous of buying

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Name

Flamande.....
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De Salers.....
Limousine.....
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Parthenaise.....
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Name

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cattle in this market is that he should know what he wants and be capable of selecting the best specimens of the breed. A buyer could purchase as large a number as he wished with comparatively little trouble, for he could avail himself of the fairs, which are held annually, monthly, and weekly in all parts of France, where several thousands of cattle are exposed to sale and change hands.

If ignorant of the language, he can readily find an interpreter, or, if he asks it, his consul will find one for him and otherwise assist him.

THE SUITABILITY OF FRENCH CATTLE FOR THE UNITED STATES.

I unhesitatingly state, as the result of my study of this subject, that the intelligent stock breeder can nowhere better than in France find as good and great a variety of breeds of cattle from which to select those suitable to the various requirements of the United States.

CHAS. P. WILLIAMS,
Consul.

UNITED STATES CONSULATE,
Rouen, May 22, 1884.

Special statistics regarding French cattle.

Name of breed.	Origin of breed.	Age at maturity.	Weight of meat, net.	Color.
Flamande.....	North of France....	Years. Pounds.		
Normande.....	Normandy.....	3	1,100	Red and brown.
Bretonne.....	Brittany.....	6	2,400	Brindle.
De Salers.....	Salers.....	6	524	Light red.
Limousine.....	Limousin.....	5	1,370	Bright red.
Charolaise.....	Saone and Loire....	3½	695	Yellow.
Parthenaise.....	La Vendée.....	4	715	Light yellow.
Mancelle.....	Maine and Loire....	5	740	Pale red.
		3½		Light red.

Name of breed.	Annual milk yield.	Milk to pounds of butter.	Size at maturity.		Live weight.	
			Cow.	Ox.	Cow.	Ox.
Flamande.....	Qts. 2,700	11	Ft. 4	In. 6	Pounds. 1,100	Pounds. 1,800
Normande.....	3,000	13				4,200
Bretonne.....	1,800	7		7 10		480
De Salers.....	1,600	8		4 6		2,200
Limousine.....				4 7		1,030
Charolaise.....				5 0		850
Parthenaise.....						1,100
Mancelle.....						1,100

DIVISION OF LAND AND CATTLE-BREEDING IN FRANCE.

REPORT BY VICE-CONSUL MARTIN, OF MARSEILLES.

OLD-TIME CATTLE-BREEDING IN FRANCE.

Until a comparatively recent date the French peasant appeared to attach no value to cattle beyond that arising from their produce in labor or in milk. Every animal that was born was either expected to do service and toil in its peculiar capacity for the whole term of its active life, and was seldom turned over to the butcher before he had reached the age of ten years or more, or be slaughtered for consumption as soon as weaned and before its keeping would become an expense to its owner.

Hence the favor that veal still finds in France as an article of food, and probably also the great natural fault of the generality of French breeds, viz, slow maturity.

Under these circumstances the farmer who, partly on account of the advanced age of the animal and partly through the collusion of the butchers, could not even obtain the price originally paid for his cattle, had come to look upon it as a sort of necessary evil, and made no effort to improve or even to maintain the integrity of the original French breeds.

INSTITUTION OF CATTLE SHOWS IN FRANCE.

In 1854 the Government, perceiving the danger of this disposition of French farmers, instituted annual shows in the several regions of the country, where prizes were awarded to the best specimens of agricultural produce, and especially of cattle, with particular attention to improvement in the direction of meat product and early maturity. At the same time the growing welfare of the people brought about a marked increase in the consumption of meat, naturally attended by an advance in prices.

The farmer was not long in finding out that he could realize a profit in the sale of his stock if it was brought to the market in a fair condition, and perceived the advantage of renewing it oftener, and at the same time made some effort towards improving its qualities and mending its faults.

CATTLE CENSUS OF FRANCE.

As to quantity there does not seem to have been decided progress made in the last fifty years. As far back as 1837, a census made in that year fixed the number of horned cattle at 9,936,538. In 1866, after the annexation of Savoy and Nice, it was estimated to be some 12,000,000; in 1876, after the loss of the rich provinces of Alsace and Lorraine, it was reduced to 11,351,220; and the returns for 1880, the last published, give an aggregate of 11,446,253.

That this number is not sufficient to meet the wants of the population is shown by the amount of importation of neat cattle in the same year, 1880, which was no less than 196,508 heads and exceeded the exportation by 137,207.

In 1881 the difference fell to 74,277 heads, but in 1882 it again rose to 108,571. The importation of butcher's meat is also large, and amounted for the three years above named, respectively, to 8,518,500, 5,745,100, and 6,028,500 kilograms.

DIVISION OF LAND IN FRANCE.

That the breeding of cattle does not keep pace with the increasing consumption of meat, nor find sufficient encouragement in the conse-

quent advance of land property. It originates in the fact that the land belongs to the State, and so the French civil territory.

It provides a means of increasing the land in an equal distribution.

It is easy to be landed.

Again, the nature, of ownership, chasing small their whole piece of land piecemeal, itate to dispose of.

The consequence almost increased, exceptionally poor, fallen into the earth all that of carrying on 75 to 90 per cent called "petite" own land with.

At the same time have none to better remuneration the necessities of help one of.

For this reason country is developing results under.

A schedule culture may be.

Agricultural produce
Wheat
Other grain
Leguminous plants
Potatoes
Beets
Colza
All other cultures

Pasture land and meadows
Orchards
Wood land and forests
Vineyards
Heath lands and other

Total

FRANCE.

quent advance of prices, can only be explained by the extreme division of land property in this country.

It originated at the time of the French Revolution, when all the estates belonging to the nobility (nearly the whole territory) were confiscated and sold at auction. Then the succession law embodied in the French civil code aggregated the effects of this first parceling of the territory.

It provides that each heir can claim to receive his share of the inheritance in kind, and that the share allotted to each should contain an equal distribution of the constituent parts of the estate, real and personal.

It is easy to imagine to what extent the working of this law has divided landed property in France since the beginning of this century.

Again, the French peasant allows the great desire, inherent in his nature, of owning the ground that he cultivates to allure him into purchasing small lots at rates which large land owners could not obtain for their whole property. The latter finding that they can by selling their land piecemeal realize profits from 20 to 30 per cent. larger, do not hesitate to dispose of it in that way.

The consequence has been, that while real estate at one time acquired almost incredible value (from \$2.00 to \$1,000 per acre, and for some exceptionally productive land as much as \$1,600), nearly all the soil has fallen into the hands of the peasantry, who excel at reaping from the earth all that industry can achieve, but who too often lack the means of carrying on agriculture on a large scale. It is estimated that from 75 to 90 per cent. of the cultivated land of France belongs to what is called "petite culture," that is, to that class of farmers who work their own land with no other help than that of their children.

At the same time those who do not own land in their own right, or have none to expect by inheritance, flock to the cities where they find better remuneration for their work and thus contribute, together with the necessities of the military service in this country, in making scarcity of help one of the most serious grievances of French agriculture.

For this reason we see that almost all the productive land of the country is devoted to such culture as may be expected to give the best results under the smallest outlay.

A schedule of the share occupied by each important branch of agriculture may here be of interest:

Arable land.	Acres.	Proportion to total surface.
		Per cent.
Agricultural products:		
Wheat	17,071,120	
Other grain	19,936,350	
Leguminous plants	4,970,536	
Potatoes	3,322,543	
Beets	1,174,893	
Corn	303,218	
All other culture	16,450,311	
Pasture land and meadows	63,288,991	50.45
Orchards	12,378,030	9.86
Wood land and forests	1,520,575	1.21
Vineyards	19,594,268	15.61
Heath lands and other unproductive land	5,336,493	4.25
Total	23,370,133	18.62
	125,194,436	100.00

DIVISION OF CATTLE IN FRANCE.

This peculiar division of land and culture in France has led to a singular division of the cattle-raising industry.

Nowhere in this country is it made a special pursuit, and the stock passes through many hands before it is finally turned over to the butcher. As a rule it is raised in those parts of the country where pasture land is abundant and the soil unfit for other culture. As soon as the young animal is strong enough it is taken to one of the numerous fairs that are held in all parts of the country; a farmer, whose ground is not extensive, will buy the calf and submit it for a short time to the light work which he requires, and after a few months, when the yearling has grown in his hands, he will take it again to the fair, sell it at a small profit, and buy another younger animal with the same prospect of profit for the future.

In this wise, the stock is bought and sold several times before it passes into the hands of an "engraisseur," who makes it a special business to buy from farmers cattle which he brings to a satisfactory condition of "fat," and finally sells to the butcher.

Under this system the different original French breeds have necessarily become mixed to a large extent, and it is difficult to determine exactly the number and importance of each. In a general way, cattle are most numerous in the northern and eastern parts of France where milk is a common diet; in the south, where oil supersedes butter very largely, the breeds show a greater aptitude for labor; and in the southeastern region, where neither milk nor labor is in great demand, there is no special breed, and the number of cattle is extremely limited.

In the seven departments forming this consular district meat cattle only number 110,018 head, or less than 1 per cent. of the total of France, and it is, so to speak, all imported either from the cattle-raising parts of France, or from Italy, Sardinia, and Algeria.

This made it impossible to collect any information directly from the breeder, which would have been of far greater value and interest; and in the following description of the most important French breeds I had recourse to official statistics as to numbers and to the works of the Marquis de Dampierre and M. J. Magne as to the several breeds.*

CATTLE CENSUS OF FRANCE.

As no census of the stock of this country was ever made with special regard to the several breeds, I have adopted the plan in the following statement to give the number of cattle belonging to each agricultural region of France which will permit a comparison of their relative importance:

District.	Area.	Proportion to area of district.		Number of cattle in 1880.				Number of head to each 1,000 acres.
		Arable land.	Pasture land.	Oxen and bulls.	Cows.	Yearlings.	Total.	
	<i>Acres.</i>	<i>Pr. ct.</i>	<i>Pr. ct.</i>					
Eastern	16,693,000	54	13	356,042	1,138,040	275,441	1,769,523	106
Northern	22,920,107	70	12	269,230	1,698,615	438,066	2,405,911	102
Western	19,989,243	58	13	907,210	1,788,925	492,137	3,188,272	159
Central	19,455,312	57	16	311,593	1,129,777	340,578	1,781,958	92
Southwestern	16,472,645	34	9	441,944	592,541	145,445	1,185,940	72
Southern	12,936,014	39	7	153,831	381,185	88,145	623,161	48
Southeastern	17,628,175	28	4	110,889	378,159	59,850	548,898	32
Total	125,494,406			3,492,739	7,113,242	1,849,272	11,455,253	...

* These interesting descriptions of French cattle are omitted, being fully covered by some of the other reports from France.

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PHYSICAL FEATURES OF FRANCE BY DISTRICTS.

*Description of Northeastern and Eastern France.**—The northeastern and eastern regions are generally mountainous, covered with wood and pasture land. Unproductive land is extensive and agriculture less advanced than in most of the other regions. The vineyards are important and produce the celebrated wines of Champagne and Burgundy. Rye is more important than wheat, and colza and hemp are also largely grown.

Nearly all the geological formations can be found in this mountainous region, the primary and granitic in the Alps, the jurassic in the Jura range and in the greater portion of the region, the cretaceous in the Champagne district, the triassic and permian in the Vosges, the porphyreous in the Beaujolais and Morvan provinces, and the alluvium in that part of Alsace that was left to France.

The climate is more extreme than in any other part of France; the mean summer temperature is 64° , that of winter 32° ; the rainfall amounts to 26.22 inches per annum. The rainy days average 137 in the year, and frost 70.

The prevailing winds blow from the northeast and southwest.

Description of Northern France.†—The northern region is the richest, most fertile, and best cultivated region of France.

The land, which is nowhere in the region absolutely unproductive, is only broken by low and cultivated hills. The proximity of Paris insures for all the produce of the region a certain and profitable outlet, and there is scarcely a branch of agriculture that is not followed.

There, too, landed property has better resisted the disintegration prevalent in France, and permitted of the valuable use of agricultural machines. In brief, every produce of the French soil is extensively and profitably grown in the northern region, except a few that require a warmer climate—the olive, orange, and grape—although some vines are to be found in some parts of the region.

It belongs entirely to the miocene formation, jurassic, calcareous, and tertiary. The climate is tempered by the sea breezes and is equally free from intense cold and heat. The mean summer temperature is 63° ; and that of winter 40° . The mild and damp winters are favorable to pastures, which acquire particular qualities from the beneficent sea air.

The rainfall averages 22 inches and the rainy days 140. Southwest and northeast winds are prevalent.

Description of Western France.‡—The western region, much alike to the northern region in its principal features, is far from equaling it in riches and advanced agriculture.

Brittany, which forms the principal part of the region, is of primary and granitic formation. It is covered with heaths and *landes*, and cannot raise successfully anything but buckwheat.

The other parts of the region have greater analogy with the northern region, and in a general way the description given of the latter applies also to the former.

Description of Central France.§—The central region contains two different parts, the plains in the north, and the central table-land in France.

*The breeds raised in this district are the Charolais, the Comtoise, and the Morvan.

†The breeds of cattle raised in Northern France are the Normandy and the Flemish.

‡The breeds of cattle raised in Western France are the Breton, the Choletais or Parthenan, and the Manceau.

§The breeds of cattle raised in Central France are the Limousine, the Salers, and the Aubrac.

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Total.	Number of to each land area.
29,522	1.6
10,511	1.2
8,272	1.0
1,958	0.2
5,940	0.3
5,161	0.3
8,808	0.2
10,254	.....

covered by

Through excessive wood-clearing the plain region has become marshy, unproductive, and unwholesome.

The soil is generally sandy, with an impervious clay substratum, where no vegetation is seen but heaths and broom. In marly parts some rye and a much larger quantity of buckwheat is grown.

The "Plateau Central," of granitic and volcanic formation, embraces some fertile valleys, that of Limagne among others, remarkable by its rich loam soil, but the vegetable earth, which is most common, has been formed by the disintegration of feldspathic rocks, is light, and fit only for woodland and meadows.

Greenswards, consisting chiefly of an herb called "*Mardus stricta*," are found on the highest summits of the table-land. Under those circumstances the region naturally devoted itself to the cattle-raising industry, and the "Plateau Central" supplies nearly all the different parts of France with large quantities of much esteemed stock.

The climate, although colder, owing to the altitude, is not excessively so, and can compare favorably with many other parts of France.

*Description of Southwestern France.**—The southwestern region, which is inclosed between the ranges of the Cevennes and the Pyrenees at the east and south, is entirely composed of plains and valleys, with the exception of the *landes*, a wide sandy expanse, resting on a pudding-stone substratum; the region is fertile and in advanced stage of culture that embraces all the agricultural productions of France except the olive and orange.

The vineyards cover nearly 2,000,000 acres, and produce the well-known Bordeaux wines and a good deal of inferior brandy. The culture of Indian corn comes next in importance, and is especially extensive in the poorer district, where the peasant uses it for food for himself and his cattle, and as flour, fuel, and bedding. The natural pasture land is also plentiful, and sown meadows give a good supply of lucern, and particularly clover, the use of which has grown to form an important branch of trade. The geological formation is entirely of the tertiary order in the plains, and in the Cevennes and Pyrenees partakes of different formations, the granitic and jurassic predominant.

The climate is moderate, the mean temperature being 69° in summer and 41° in winter; the rainfall averages 23 inches, distributed in 130 rainy days in the year. Frost is seldom seen for more than 35 days.

Description of Southern and Southeastern France.—The southern and southeastern regions are quite different in every respect from all the other regions of France.

The climate, produce, culture, and general aspect are entirely peculiar to the region. Wood and pasture lands are scarce, the calcareous hills and mountains, stripped of the last vestige of a tree, are barren and grow nothing but shrubbery and aromatic herbs, on which constantly browse numerous herds of starveling sheep that are led from one hill to another and lay waste all those parts of the country through which they travel.

Three-fifths of the region are utterly sterile and deserted. On the other hand, the two other fifths are remarkably productive and turned to culture which cannot be attempted in any other portion of France. The olive, orange, mulberry trees thrive admirably; the vine is extensively cultivated and produces immense quantities of wine, which, although of inferior quality, brings an important revenue to the country. In some part flowers grow in the open air at all times of the year, and

* The breeds of cattle raised in Southwestern France are the Garonnaise, the Bazadaise, the Gascon, the Bordelais, and the Pyrenees.

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Imported from—	
Italy.....	
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Switzerland.....	
Germany.....	
Holland.....	
Spain.....	
Other countries.....	
Total.....	

give rise to numerous factories for the preparation of essential oils and perfumery, and to an important production of honey.

The drought is nearly permanent, and is broken only by floods of rain which are more injurious than beneficial, as they frequently occasion dangerous inundations and carry away a good deal of precious vegetable earths.

In the Valley of the Rhone the rainy days only number from 120 to 130 in the year, and 53 on the Mediterranean shore, and still the rainfall is larger than in any other parts of France, and averages 38 and 26 inches respectively.

The climate is more moderate on the sea-shore where the mean temperature is 72° in summer and 42° in winter. In the interior the mean winter temperature is 35°.

The prevalent winds are the northwest or mistral, a cold and violent wind, and the southeast or rainy wind.

CAMARGUE CATTLE.

The only original cattle breed of the region is the Camargue breed. Its only interest lies in the fact that it lives in a semi-wild condition in the Camargue, a marshy delta of the river Rhone. It is of small size and measures about 4 feet 4 inches; its color is generally black, sometimes red; the head is elongated; the horns are long and in the shape of a bow.

There are no stables in the delta, and the herds are allowed to roam through the island at liberty all the year round.

When the young calves are born they are fastened to pickets sunk in the ground and have to wait until their mothers are willing to come and nurse them.

No use has ever been made of the breed except for bull-fights, and it is rapidly disappearing.

At the present day there are not more than eight hundred head living in Camargue. All the other cattle found in the region is imported from other parts of France, or Algiers, Sardinia, and Italy.

FRENCH IMPORTS AND EXPORTS OF CATTLE.

To close this report and give an idea of the cattle trade as carried on in France, I have appended the following schedule of the importation and exportation of cattle for the year 1882:

IMPORTS.

Countries.	Oxen.	Cows.	Bulls.	Yearlings.		
				Male.	Female.	Calves.
Imported from—						
Italy.....	57,058	17,740	311			21,127
Algeria.....	18,730					
Belgium.....	3,192	20,148	1,165	2,073	2,126	24,290
Switzerland.....		5,674		966	406	6,065
Germany.....	4,240	3,785		872	1,360	3,382
Holland.....		3,648			226	
Spain.....		288		201		598
Other countries.....			264	167	121	743
Total.....	83,220	50,692	1,740	4,270	4,239	56,814

EXPORTS.

Countries.	Oxen.	Cows.	Bulls.	Yearlings.		
				Male.	Female.	Calves.
Exports to—						
England	21,094					1,196
Belgium	11,052	9,505	847	62	2,107	738
Switzerland	13,066	5,003	88		508	4,500
Spain		8,272		1,003		1,009
Germany		6,439	65		1,370	1,297
Other countries	1,210	721	70	10	278	365
Total	46,422	29,943	1,065	1,223	4,258	9,183

J. S. MARTIN, JR.,
Vice-Consul.

UNITED STATES CONSULATE,
Marseilles, February 5, 1885.

CATTLE RAISING IN THE SOUTHWEST OF FRANCE.*

REPORT BY CONSUL ROOSEVELT, OF BORDEAUX.

In the departments of France forming the consular district of Bordeaux there are five principal breeds of cattle, viz, the Garonnais, Bazadais, Bordelais, Landais, and Limousin.

ORIGIN OF THE BREEDS.

Garonnais.—Native of the country through which the Garonne River flows; the most abundant breed of the Southwest of France; has always been known in the country, and has not been crossed.

Bazadais.—Issued from the Pyrenean breed and imported, at the beginning of the sixteenth century, into the environs of the town of Bazas; has a great resemblance to the Garonnais, and has never been crossed; is considered one of the oldest breeds of France.

Bordelais.—A cross-breed of Brittany and Dutch; was imported into the locality at a remote period; is preserved from degeneration by the constant renewal of the blood.

Landais.—Issued from the Pyrenean breed, and raised only in the department of the *landes* (moorlands); has undergone the changes naturally due to the difference of climate and soil, and has become adapted to the country, where, under the local influences, it has almost become a new breed; has not been crossed.

Limousin.—Raised especially in the environs of the town of Limoges; seems original to the country; has not been crossed.

DESCRIPTIONS AND GENERAL CONSIDERATIONS.

Description of the Garonnais.—Buff color, sometimes darker about the head, hoof, and tail; bull, 5 feet 4 inches; cow, 5 feet tall, without being

* NOTE BY CONSUL ROOSEVELT.—This report is compiled from information derived from the municipal veterinary surgeon in charge of the slaughter-house of the city of Bordeaux, M. Marcel Courregelongne, one of the most eminent cattle-breeders of this department, and also secretary of the Society of Agriculture of the Gironde; from the manager of the General Milk Company of Bordeaux, the municipal records, the newspapers of this locality, and from the most reliable authors.

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"high above ground;" very thick bones and strong limbs; thick muscles, long body, well supported; deep but rather narrow chest, flat ribs, rather thick neck, fore quarters more bulky and heavier than hind ones; rather flat thighs; thick skin, thick flat horns bent forward and generally downward.

This fine breed forms the wealth of the Southwest of France, to which it gives its work and meat. Strong, docile, and handy, it works well and much, but with a slow pace.

The ox takes flesh easily; the cow hardly has milk enough to feed her calf.

Raising Garonnaise calves.—If the calf is intended to make a beast of burden, he is fed, until four months old, by his mother and at the same time by a Brittany cow used as assistant nurse (that cow assists in feeding three calves), then he receives a little bran until six months old, when he is weaned. He is then sent grazing all day and stabled at night; he receives besides green or dry forage, according to the season. Such is the diet he will follow up to his last day. When thirteen months old, he is castrated and begins to be broken to the yoke; from that age to that of two years and a half, he is employed to do the light work of the farm; from two and a half to five or six years old, he is put to the coarser works of agriculture, then stabled to be fattened. The fattening begins in February and is finished at the end of September. The animal receives at first radishes and turnips, which are chopped with straw, then purple clover and corn fodder; to that green forage is added bran, corn, flour, and rape or linseed cake; during all the time of fattening the ox is not allowed to go out.

A calf three and a half or four months old is sold for the stall at from \$18 to \$30.

If the calf is intended to be kept for reproduction, he is weaned only when nine months old, and up to that time has three nurses besides a special food of meal or floury substances; he is then sent grazing during the day and stabled at night; when ten or eleven months old he may be sold for \$60 or \$70; he begins to serve when fifteen months old, and when he reaches the age of thirty months he becomes too heavy for covering; he is then fattened without being castrated, and sold to the butcher at the price of 7 cents per live pound. The cows are covered when fifteen months old; they go to pasture during the day, and receive a ration in the stable where they are kept at night; this ration consists of green or dry forage according to the season.

Working Garonnaise cattle.—The cows work like the oxen. When farrow or too old to work, they are fattened and sold to the butcher, who pays about 7 cents per live pound.

An ox at the age of maturity, five or six years old, weighs 1,100 or 1,200 pounds. After having been taken away from the work and fattened he weighs from 1,300 to 1,400 pounds. He is then sold to the butcher at from \$150 to \$175, and yields 55 per cent. of the live weight in meat. When specially fattened for the stall the ox weighs up to 2,500 pounds, at about four years of age. Its flesh has a fine grain.

A pair of working oxen, from four and one-half to five years old, are sold at from \$260 to \$300.

A pair of Garonnais oxen can pull a cart-load (two-wheeled cart) of 10,000 pounds weight for 12½ miles in one day, but can work at that rate only three times a week. The working pace is about 1½ miles per hour. The working animal is fed on bran, dry hay, and sometimes a little ration of oats.

Meat product of Garonnais cattle.—The following is the product of two young oxen which had received premiums at a cattle show:

No. 1, three years and ten months old:		
Live weight at the slaughter-house	pounds..	1, 48
Weight of the four quarters	do.....	848
Proportionate weight of the four quarters to the live weight	per cent..	62-91
Weight of the tallow	pounds..	110
Proportionate weight of the tallow to the four quarters	per cent..	12-83
Weight of the skin	pounds..	107
Proportionate weight of the skin to the four quarters	per cent..	12-96
No. 2, three years and eleven months old:		
Live weight at the slaughter-house	pounds..	2, 176
Weight of the four quarters	do.....	1, 366
Proportionate weight of the four quarters to the live weight	per cent..	63-78
Weight of the tallow	pounds..	162
Proportionate weight of the tallow to the four quarters	per cent..	13-19
Weight of the skin	pounds..	136
Proportionate weight of the skin to the four quarters	per cent..	10-00

Garonnais cross-breeds.—An author says that this breed deserves the name of "Shorthorn of the South," having the same form and bearing and the same propensity to fatten when young. It is supposed to be a cross-breed of Garonnais and Dutch. According to reliable documents large numbers of Garonnais were exported to England in the fourteenth and fifteenth centuries, when the South of France was occupied by the English. This breed has never been crossed by any foreign blood. It is left to itself for reproduction, the raisers hardly taking any care to secure good bulls. The cattle-breeders say that this breed should not be crossed in its native country, because that would make it lose the qualities which render it particularly adapted to the locality. All cross-ings hitherto tried have proved complete failures. This breed represents about two-thirds of the cattle in the department.

Garonnaise grazing country.—The altitude of the country is about 250 feet above sea-level. The mean temperature is 56° F.—in summer, 72°; in winter, 43°. The soil belongs to the secondary and tertiary periods.

The agricultural soil is composed of—

	Acres.
Limestone	132, 750
Rich compost	32, 500
Gravel	1, 700
Stony ground	18, 900
Sandy ground	27, 500
Heathy ground	12, 350

The soil of the plain and great valleys is very fertile. The plain of the Garonne, of proverbial fertility, lies on alluvial ground 12 feet deep. The culture of the ground is triennial; first year, wheat and cereals of spring and autumn growth; second year, green forage; third year, hemp, tobacco, rape, and linseed.

THE BAZADAIS CATTLE.

Description.—Dapple dark gray; nose, anus, and inner part of thighs white; eyes encircled with white hair; some of cows are light gray. Bull 4 feet 8 inches, cow 4 feet 4 inches high. The animal is compact, "close to the ground," with thin, dense bones; powerful muscles ended by strong sinews; harmonious and wonderfully balanced body; loins very well attached. The animal is built for fatigue and endurance, with broad and neat articulations; hind quarters broad, well made, with thick flesh and muscles from rump to knee; hofs hard and of a good quality; head short, broad at the forehead; horns well attached; neck

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...do.... 1,366
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...pounds.. 162
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...pounds.. 136
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short; ribs round; stands remarkably plumb on his legs; tail well attached; skin rather thick, of a light tissue, with somewhat rough hair. Being energetic and having a quick pace, these animals are eminently fit for work. Yoked to enormous two-wheeled carts, they carry prodigious loads under a scorching sun, and sometimes with a sandy dust which renders their work very painful.

With all the qualities of a beast of burden, the Bazadais is also good for the butchery, and, though weighing less than the Garonnais, is frequently rewarded at the fat-cattle shows. It is preferred for the butchery, being in general fatter than the Garonnais; its flesh is better, gives more of the choice cuts, and yields a greater average of meat—more than 60 per cent. of the live weight.

The ox takes flesh much more easily than that of the Garonnais breed. The cow hardly has enough milk to feed her calf.

Bazadais calves.—If the calf is intended to make a beast of burden he is treated exactly as the Garonnais; sometimes sent grazing, but generally kept in the stable. He is castrated when twelve months old, and begins to be broken in three months after; he is then used for light plowing and harrowings. When three years old he is yoked with a companion to a two-wheeled cart, and carries 2,500 pounds, but for short distances only. When four and a half years old he is used for hard work till the age of six or seven, without showing any sign of great fatigue.

Weight and value of Bazadais oxen.—A pair of Bazadais oxen can pull 10,000 pounds weight for $12\frac{1}{2}$ to 13 miles in one day, but can work at that rate only three times in a week. The working pace is about 2 miles per hour. The working animal is fed on bran, dry hay, and sometimes a small ration of oats. A pair of working Bazadais oxen from four and a half to five years old are sold from \$220 to \$260.

One-third of the Bazadais working oxen are used for carting heavy loads, one-fifth are sold for the vineyards of Medoc and Sauterne, the rest are employed for agricultural purposes in the Bazadais region. This latter portion is fattened when from four and a half to six years old, whilst those belonging to heavy works are fattened only from the sixth or seventh year of their age. The fattening begins in May and terminates at the end of February. From May to October the animal is fed on green forage, corn fodder, vetch, and purple clover. From October he is fed on hay, bran, corn meal, rape, and linseed cake.

A Bazadais ox at the age of maturity (five or six years) weighs from 900 to 1,000 pounds; after being fattened as above he weighs from 1,100 to 1,200 pounds, and is then sold to the butcher at the rate of 12 cents per pound live weight.

The cows work like oxen. The calves are bought for the butchery from \$18 to \$30 a head; their flesh is very white and greatly praised. When raised expressly to be fattened, on reaching its full growth, the animal weighs about 2,000 pounds.

In the southwest of France the Bazadais represents about one-third of the bovine species and the Garonnais two-thirds.

The Bazadais as a bone-making animal.—A reliable author mentions as a known fact that in the country where the Bazadais is raised the horses become small and slender, with small carcasses, whilst the oxen become compact, thick, and long; in other terms, in the same country, under the same influences, and with the food produced by the same soil, the bony system of the horse is reduced to the smallest proportions, whereas that of the oxen takes a great development. This would tend to prove that the Bazadais oxen have a particular tendency and aptness to as-

simulate the calcareous salts contained in the pastures. If the Bazadais ox is really endowed with the faculty of "easily making" bones, it would be a useful importation into countries the soil of which is too poor in calcareous salts to properly feed beasts of burden; and, on the other hand, if it was imported into countries the soil of which would supply abundant calcareous salts, the frame might be, in the course of time, developed to a great size and power.

The Bazadais grazing grounds.—The altitude of the country in which that breed is raised is 270 feet above the level of the sea. It is composed of flat grounds, with little valleys, where spring many calcareous waters. The mean temperature is 62° F.—in summer, 69°; in winter, 43°. The soil belongs to the superior miocene formation, characterized by the shell-marls, containing all the varieties of cerites with yellow conchiferous sands and yellow or gray clay, often characterized by the *Ostrea undata* and *Ostrea crispata*. The ground is undulated and varied. On the same farm clay, sand, gravel, limestone, &c., are met with. The underground is as varied as the arable ground; it is composed of clay, flint, stone, and limestone, but is not deep.

The culture is biennial—first year wheat and rye, second year corn, potatoes, beet-root, and spring forage; besides every farm has about one-third of its extent in artificial meadows.

THE BORDELAIS CATTLE.

Description.—Black and white (piebald). Bull, 4 feet 6 inches; cow, 4 feet 2 inches high. Hind quarters developed as compared to the fore quarters; thin limbs; small bones; angular forms; pelvis very wide; neck thin and almost fleshless; head fine; horns thin, black, bent forward, and often rough; udder expanded without being fleshy; milk abundant.

Qualities of the Gironde Bordelais.—This breed was imported into the Gironde many years ago, for dairy purposes solely, being the result of crossing between the breeds of Brittany and Holland; it was and is still maintained by constant importations of Dutch bulls. It can hardly be called a breed, as it does not reproduce itself exactly. It is comparatively scarce, being used only for the dairy. Of the Brittany cow, from which it originates, cut 22, gives a pretty correct idea of it. The female only is known and described, as the young males are sold for the stall. The bulls and cows when too old to breed are sent to the slaughter-houses, but the meat is of inferior quality. The weight of the cow is about 500 pounds when at maturity, 4 years old; it is then sold at from \$80 to \$100. The price of the bull is \$80; after two years' service he is sold to the butcher.

The Bordelais as milkers.—This is the only breed which provides the department of the Gironde with milk. After calving the cows give 4½ gallons of milk a day for one month. Afterwards it gradually goes down to 2 gallons. The average quantity given by one of these cows amounts to about 650 gallons per annum, with a proportion of 2.90 per cent. of butter and 3.35 per cent. of dry caseine.

The Bordelais not suitable for exportation.—The Bordelais could not be profitably exported—(1) because it degenerates if not renewed by frequent crossing; (2) because as a milker it is not so good as the Normandy cow.

The grazing-grounds of the Bordelais.—The altitude of the country is about 150 feet above sea-level.

It is generally composed of flat and undulating ground. The arable soil is composed of clay, pebble, limestone, and sand. The mean tem-

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Feeding and housing Bordelais cows.—The cows of the Bordelais breed are left in the fields day and night as long as the weather permits; when stabled (in cold or snowy weather) they are fed on second-crop hay, coarse cabbage, and any kind of green food that may be had cheap. Those kept by rich people have rations of bran added to the above. When the pea season sets in, very large quantities of that vegetable are daily shelled in the city of Bordeaux at the establishments for preserving vegetables, and the pods are sold for the cows, who are very fond of them. That food gives a particularly sweet taste and pleasant flavor to the milk.

EXPERIMENTAL CATTLE-FEEDING IN FRANCE.

It may be interesting to note the following remarks, being the result of experiments made by a breeder of dairy cows, although such experiments have not been made on local breeds.

To properly keep cattle in France requires every day 1 pound 11 ounces of hay, or the equivalent of it, for each 100 pounds weight of the live animal. An animal, to be completely satisfied, requires every day one-thirtieth of his weight. Besides that one-thirtieth in dry substances, he wants four-thirtieths of water, or any other liquid contained in the food. If, to be completely satisfied, a cow requires a daily food of 3½ per cent. of its weight, and if 1½ are necessary to sustain life, it ensues that the half of the ration is *keeping food* and the other half is *productive food*. Each pound of productive food gives one pound of milk, or increases by nearly 1 ounce the weight of the calf in the mother's womb; and for the animals which are being fattened, 10 pounds of forage give 1 pound of increase in weight. The calf at its birth weighs one-tenth of its mother's weight. During the first month after calving, the cow gives a weight of milk equal to 3½ per cent. of her weight. Afterwards the milk diminishes gradually.

THE LANDAIS CATTLE.

Description.—Buff color, with a lighter hue around the eyes and the extremities. In some animals that color is darker, and sometimes tinted with bay. This breed is much smaller than any of the before mentioned the bull being only 4 feet 4 inches and the cow 4 feet high. It is a small or rather mean variety of the great Pyrenean family, hardly interesting to others than the inhabitants of those barren countries. The animal is small, compact, well-shaped, energetic, and quick, with long thin horns, dead white, with black tips. It is extremely sober, and is noted for its endurance; its fine and nervous limbs, like those of the Devon breed, have a peculiar character and prove its swiftness. The animal is kept in good condition, in spite of hard plowings, with very little forage, and that of the worst kind. The cow, though not strong, is equally enduring, and without extra food works very hard, even whilst feeding her calf. The animal trots very well without losing breath; oxen unaccustomed to the cart have been known to travel from 47 to 50 miles in one day and night.

A pair of Landais oxen in working condition, four and a half to five years old, are sold at \$180 to \$200. When specially fattened the ox may reach the weight of 1,600 pounds. In spite of its qualities this breed is not of sufficient value to export.

The grazing grounds of the Landaise.—The altitude of the country is 160 feet above the level of the sea.

Flat and barren ground (moorlands). Mean temperature in summer, 72°; mean temperature in winter, 44°.

THE LIMOUSIN CATTLE.

Description.—Buff color, with a paler hue at the inner part of the limbs; large soft eyes, surrounded, as well as the muzzle, by a whitish circle. Smaller than the Garonnais, but larger than the Bazadais, thus giving an average height of about 4 feet 6 inches for the cow and 5 feet for the bull. There is a great variety in the size of the animals, owing to the places where they are raised. They have a softer skin and are much finer and less bony than the Garonnais. Body rather long; withers high and not muscular; hind quarters narrow; short neck; thick head; horns pale, with brownish tips, flattened towards the base, not always well bent, turned forward and often downward. The cow is small, delicately shaped, and would be remarkably fine if not overworked. She has round ribs and well-made hips; is very spirited, and works much more quickly than the ox, which goes slowly and lazily. The cow gives scarcely any milk. The cause of this difference is that the cow is the exclusive product of the locality, which is poor, whereas the male calves and young oxen are the objects of an active trade, and are bought by persons who take them into richer countries, where they are fed preparatory for work and the slaughter-house. The difference in the diet makes the difference in the size. The Limousin makes flesh more rapidly than the Garonnais, and the quality of the meat is superior.

A pair of working oxen bring from \$240 to \$280. When specially fattened a Limousin ox will weigh about 2,200 pounds.

Grazing grounds of the Limousin.—The altitude of the country is 300 feet above sea-level.

Highest temperature in summer 90°; lowest temperature in winter, 10°. Soil of the primitive period, formed by the desegregation of granitic, gneissoid, porphyric, and feldspathic stones.

The arable ground is clayish, gravelly, or sandy, without a sufficient thickness, which causes many large plains to be covered with heath. The substratum is clayish or loamy, rather permeable.

The cultivation is biennial. First year, fallow, black wheat, radish, and potatoes; second year, rye or wheat.

The soil is undulating, the climate damp and cold, and liable to great variations of temperature.

Besides the above principal breeds, this district contains a few other of lesser importance which never come on the market of Bordeaux, and which, for that reason, are not known.

HOW TO EXPORT CATTLE FROM BORDEAUX TO THE UNITED STATES.

The best and only method of direct exportation to the United States from Bordeaux is by the Bordeaux Steamship Company, which makes regular monthly voyages. The conditions of the company, submitted to the emigration laws, are the following:

- (1) Only ten head of cattle can be carried at a time.
- (2) The animals will be placed on deck.
- (3) The freight for each animal will be \$80, including shipping, landing, attendance on board during the passage, and accommodation.
- (4) The food will be provided by the shipper. The daily food required for an animal on board is 10 pounds of hay and 8 pounds of bran. The wholesale price of hay is about 80 cents per 100 pounds,

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bran \$1.60 per 100 pounds. Counting fifteen days from date of shipping to that of landing, both inclusive, each animal would eat:

10 pounds of hay, $\times 15 = 150$	\$1 20
8 pounds of bran $\times 15 = 120$	1 02
	3 12

This added to the freight makes a total of \$83.12 per head. The prices of freight of the Bordeaux Steamship Company applies to choice animals carefully attended to, but the freight of animals sent in cargoes by American ships would be much cheaper.

FRENCH BREEDS SUITABLE FOR EXPORT TO THE UNITED STATES.

Among the breeds hereinbefore mentioned only two might perhaps be worth importing into the United States, the Garonnais and Bazadais. The former, on account of its size and powerful frame; the latter, on account of its energy as a beast of burden, of its yield in good meat, and of its wonderful power of assimilating food. The cost price of a couple of choice Garonnais would be about \$300, that of a couple of choice Bazadais about \$260.

EXPORT OF AMERICAN BEEF CATTLE TO BORDEAUX.

It would not be advisable to import any breeding animals into this district, because all the crossings hitherto tried with the local breeds have proved complete failures, and consequently the cattle raisers are not inclined to try new experiments; if they were so inclined, they would choose bulls belonging to breeds known in France, and not purchase animals of a breed unknown to them.

If the importation of breeding animals is not likely to give any good result, the importation of live stock into Bordeaux for the butchery would, on the contrary, meet the requirements of the market, and the probabilities are that the introduction of such animals, if arriving in good condition, would be a profitable speculation.

In order to elucidate the matter, so as to bring the question within the comprehension of any person concerned, I shall first explain the manner in which the city of Bordeaux is supplied with meat, the part acted by the commissioners, who are the intermediates between the producers and the butchers, their systematic removal of live stock from the market in order to raise the prices, &c. This will be seen in the following extract of the newspaper *La Victoire* of Bordeaux, of December 16, 1880:

Generally on arriving at Bordeaux the dealer cannot wait until his stock is sold and paid for; not being rich he requires ready money for other business. The commissioner is there, ready at hand; he examines the cattle, values it after his own fashion, tries to hint that the butchers are well provided, the market bad and overstocked, &c.; he advances to the dealer a certain sum of money, about three-fourths of the value of the cattle; but often, to end sooner and not to wait ten or fifteen days for the settlement of the sale, the merchant prefers to transact for a trifling profit and gives up the cattle to the commissioner, who then makes the best of it.

The same article mentions the punishment which the commissioners inflict upon the dealers who do not prove sufficiently accommodating:

Frequently the commissioners send their employés to the fairs of the region in order to prevent sales from the dealers who were unyielding to them.

The part of the commissioner is thus defined in *La Victoire* of December 3, 1880, by a letter of Mr. Olagnier, a municipal councilor, who made a special study of the question:

The commissioners are at the same time the bankers of the producers, from whom they most often discount the price of the cattle which is sent to them for sale; and of

the butchers, to whom they sell the same cattle on a credit of seven or eleven days; they, besides, are merchants, buying and selling for their own account, and then, being holders of nearly all the cattle intended for the supply of our city's market, they can, owing to their small number, maintain the prices at a high figure. I have contended, and the fact is verified by two members of the municipal council who raise and sell cattle, that the commissioners of Bordeaux pay for cattle a *lower price* than that paid by the commissioners who supply the markets of Paris, while it is a well-known fact that beef is cheaper in Paris than in Bordeaux.

Consulting the records of the municipal council I read in the report of the sitting of November 12, 1880, the following statements corroborating the preceding one:

Correspondents and at the same time bankers of producers and of the butchers, and being, besides, merchants, they centralize the cattle, deliver to the market only the number required to maintain the highest prices, and by the influence which they exercise on the butchers by advancing them money they paralyze the spring of competition, which is necessary to reduce prices to their real level.

At the sitting of the municipal council of February 12, 1880, one of the members, M. Min-Barabraham, read reliable documents showing that the commissioners paid their own price for the live cattle, and that, owing to their then scarcity of forage, the owners were obliged to get rid of their cattle at unremunerative prices, and after having quoted the report of a special commission named by the municipality to investigate the matter, the report showed that meat in the city of Bordeaux was dearer than in Paris or any other large city of France. He found that the price of meat was always increasing, "even in the years when the price of cattle had obviously gone down on account of bad forage harvests." M. Min-Barabraham mentioned that as far back as 1870 he called the attention of the council to the high price of beef; that a commission was then ordered to inquire into the causes of such dearth and try to remedy it; that in 1874 attention was directed to the constant and unreasonable increase of prices, when the mayor appointed a new special commission to investigate the former, and also to find the means of admitting free competition. This commission, however, did not prevent the continual increase of prices. The honorable councillor then said:

When one of the branches of trade, that which serves the public alimentation, is in the hands of eight or ten commissioners, who are at the same time speculators and merchants, who can at their will cause a rise by allowing on the market only the cattle that they wish; who hold in their power a majority of the butchers by the weekly credits which they (the commissioners) grant them, I say that this is no longer liberty, it is monopoly.

The last word seems to be the alarm-cry uttered by everybody in Bordeaux for the last twelve years.

On the 12th of November, 1880, Mr. Olagnier, a municipal councillor, presented a petition by which 4,500 inhabitants, in presence of the excessive prices reached by the butchers' meat in town, claimed the re-establishment of taxed prices; and another member of the council mentioned that for the last twenty years the price of meat had more than doubled.

The consequences to be drawn from all the preceding is that the commissioners monopolize the cattle trade at Bordeaux; that they admit to the market only the small number of animals required to maintain the highest prices; that the cattle-raisers, merchants, and butchers are at their mercy; that the municipality have for years been constantly in search of the means of checking the monopoly; that the public is deprived of the most necessary article of food on account of the small quantity of meat sent to the stalls, and especially of high prices demanded for it.

In presence of the transportation of speculation, 221,000 inhabitants were destroyed amount would

COST OF INT

The cost of animals from the is as follows:

Customs dues cents per 100 must be sent head, and for food, litter, and does not provide by the establishment a day's ration. If the animal charges for each cow, 4 cents (tendance), 27 cents house dues. The purchaser.

If, instead of served in ice th

Customs dues
Town dues

Total

CATTLE C

The total number head, viz:

Oxen and bulls
Cows
Calves

With the following
Garonnais
Bazadais
Bordelais
Limousin
Pyrenean of various
Landais

Total

UNITED STATES
Bordeaux

In presence of such a state of things, my opinion is that the importation of live stock from the United States would prove a paying speculation, as it would meet the most urgent wants of a population of 221,000 inhabitants, consuming yearly 22,000 oxen. If the monopoly was destroyed, and if meat became more abundant and cheaper, this amount would increase 50 per cent.

COST OF INTRODUCING, STABLING, AND FEEDING CATTLE IN BORDEAUX.

The cost of introduction, stabling, keeping, &c., of the imported animals from the day of their arrival to that of their sale to the butcher, is as follows:

Customs dues, per head, \$2.89, if imported direct. Town dues, 48½ cents per 100 pounds' weight. All animals intended to be slaughtered must be sent to the official pens, where it costs for oxen 29 cents per head, and for cows 19 cents per head for the first twenty-four hours, food, litter, and attendance not included. If the owner or purchaser does not provide food, litter, and attendance, these are given *ex officio* by the establishment at the following rates: Nine pounds of hay (half a day's ration), 10 cents; litter, 2 cents; attendance and water, 4 cents. If the animals remain more than twenty-four hours in the pens the charges for each succeeding day are the following: Stabling, oxen or cows, 4 cents per head; food (eighteen pounds of hay, litter, and attendance), 27 cents. When sold, it costs 77 cents per head for slaughter-house dues. This latter charge is at the expense of the butcher or purchaser.

If, instead of live stock, the importations consisted of fresh meat preserved in ice the expenses would be as follows:

	Per 100 pounds.
Customs dues.....	\$0 29
Town dues.....	96½
Total.....	1 25½

CATTLE CENSUS OF THE BORDEAUX CONSULAR DISTRICT.

The total number of cattle in this consular district amounts to 656,000 head, viz:

Oxen and bulls	157,500
Cows	330,900
Calves	167,600

With the following proportion of the different breeds:

Garonnais	190,000
Bazadais	32,000
Bordelais	6,000
Limousin	149,100
Pyrénéan of various breeds.....	238,900
Landais	40,000
Total.....	656,000

GEO. W. ROOSEVELT,
Consul.

UNITED STATES CONSULATE,
Bordeaux, ———, 1883.

NORMANDY CATTLE.*REPORT BY CONSUL GLOVER, OF HAVRE.***WORKING CATTLE IN FRANCE.**

In some portions of France oxen are still extensively employed in various kinds of work, and particularly on the farm. Many persons contend that for such uses, and in certain localities, they can perform a given amount of work at less expense than horses. To me this seems improbable. Still there may be some kinds of rough ground where oxen can be very advantageously employed. They walk more slowly than horses, and are more even in their gait, so that in "new ground," or in stony lands, they may be very desirable. But it is not necessary to pursue this branch of the subject further, inasmuch as cattle, in the United States, are esteemed chiefly on account of their qualities for the dairy or the butcher. The cow that produces the largest amount of milk and butter—other things being equal—is the best cow, and the bullock that furnishes the most beef of good quality, in the shortest time, is the best ox.

It is not my purpose to attempt a full description of all the various breeds of cattle in France, but to give as complete information as I can in regard to the races in the northern part of the country, and particularly those in Normandy.

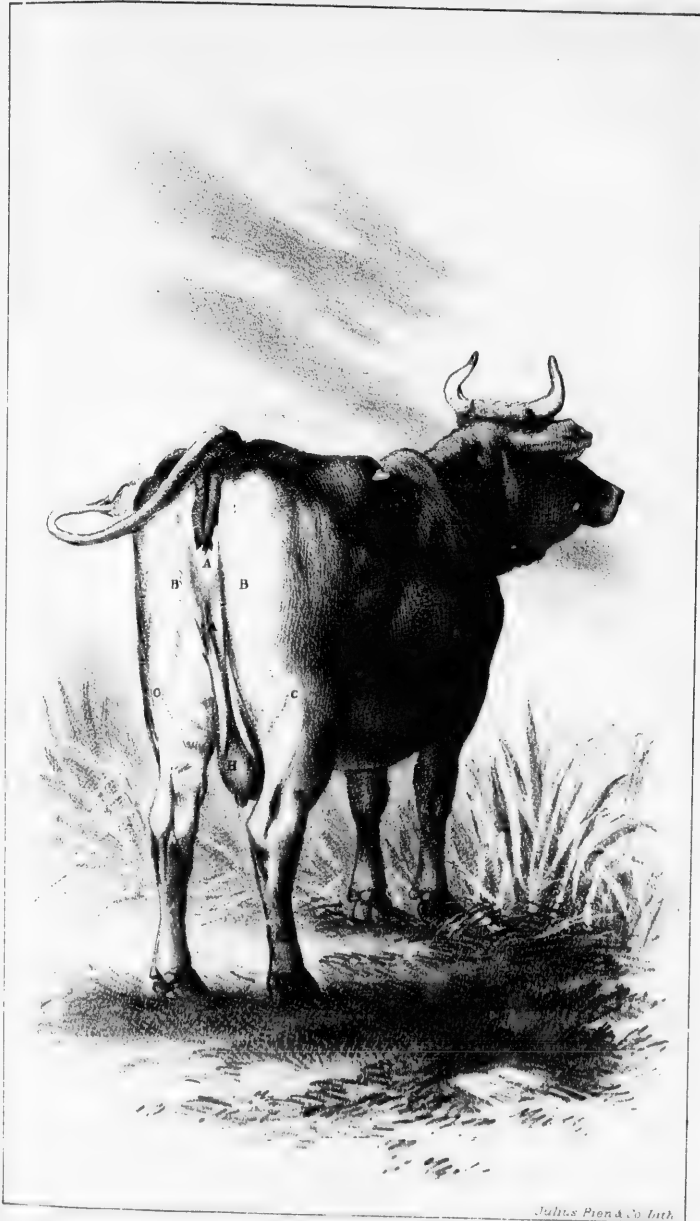
NORMANDY, ITS SITUATION, SOIL, CLIMATE, ETC.

This province is bounded on the north by the English Channel, and lies on both sides of the river Seine. It is composed of five departments, viz: Seine Inférieure, chief cities Rouen and Havre; Eure, chief city Evreux; Calvados, chief city Caen; Manche, chief city St. Lo; Orne, chief city Alençon. Although Normandy is situated between the 49° and 50° north latitude, the climate is temperate. The mercury rarely rises above 75° in summer, and ice is not often formed to exceed half an inch in thickness in winter. Snow scarcely ever falls to any considerable depth, and generally disappears in a few hours at most. Such a climate is well adapted to the raising of cattle. In parts of the province some kinds of grasses remain green the year through. The surface of the country is rather uneven, being intersected by many streams, which flow into the channel. Still much of the "up-land" is of good quality, while the bottom land is wonderfully productive.

Taken as a whole, Normandy is a very fertile country, but all portions of the province are not equally favorable for cattle raising. The departments of Calvados and the Manche, which lie on the west side of the Seine, are very remarkable for their fine cattle, and especially for butter-producing cows. In these departments are to be found the purest Norman types.

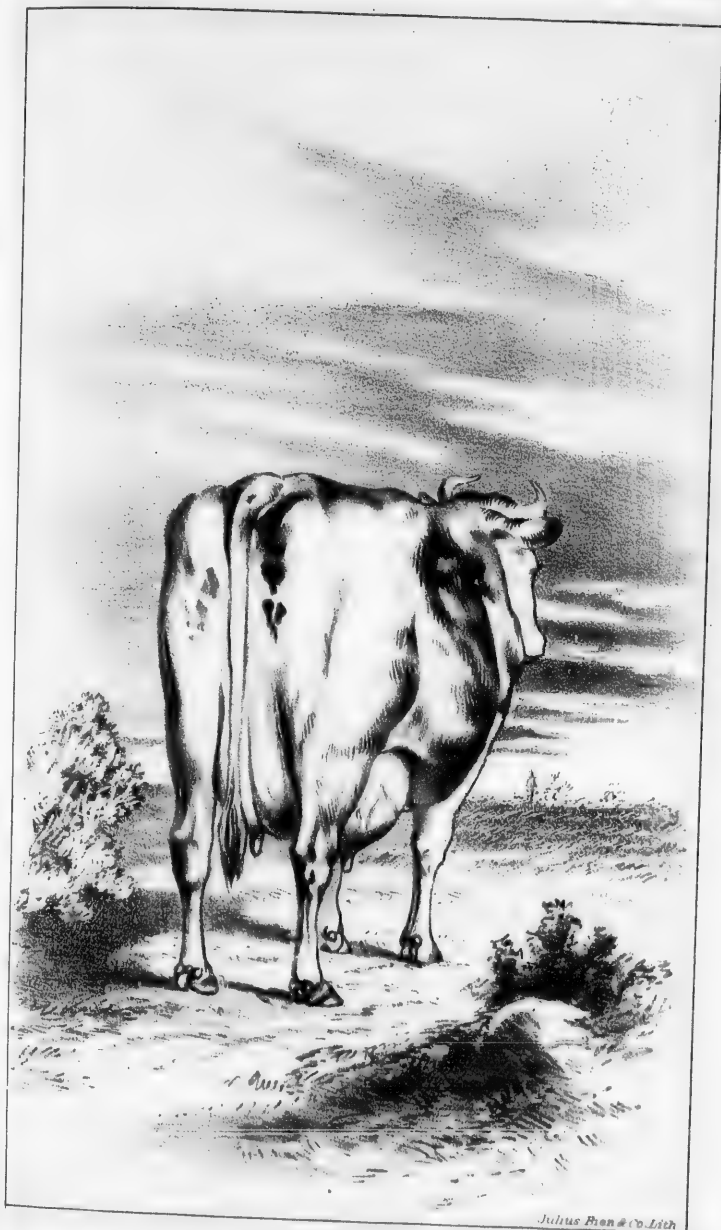
CHARACTERISTICS OF THE NORMAN BREED.

Of the Norman race there are two varieties which are particularly distinguished, viz, the Cotentin and the Augeronne, the former being the more highly esteemed. The following are some of the peculiar characteristics of this race: Size large and often not very handsome,



NORMAN COW





HOLLAND COW

NORMAN MILCH COW (COTENTINE)

Julius Fren & Co. Ltd.

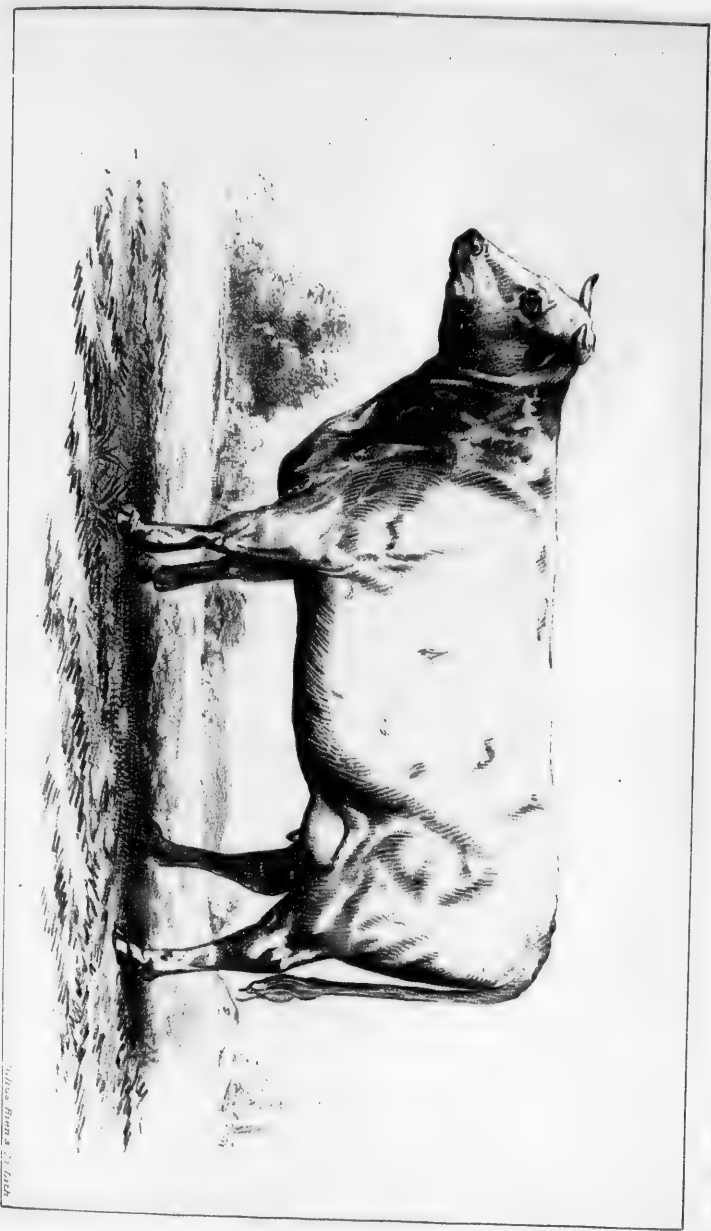


NORMAN MILCH COW (COTENTINE)

Julius P. R. & Co. Lith.

DURHAM-NORMAN COW

Wills, Diana, 1910



DURHAM-NORMAN COW

W. P. Smith, 1875

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large bones, with head rather heavy and long, the mouth large, horns crumpled and white as ivory. They are of many colors, but most of them are what we would call "brindle cows." I inclose a cut, which will aid in forming a just estimate of their form and general appearance. In my judgment, there are few better cows for dairy purposes to be found in any country than this Cotentin variety.

THE NORMAN CATTLE PREFERABLE TO THE JERSEYS OR ALDERNEYS.

The very best cows of this breed are to be found between Caen and Lisieux, where they are sometimes called "*vaches de pays*," that is to say, cows of the country. I am of opinion that some of these Norman cows could be imported into the United States and advantageously crossed with certain American breeds. They are most excellent milkers of good disposition, and their milk is both abundant and rich. All things considered, they are certainly to be preferred to the English Jerseys or Alderneys.

NORMANDY BUTTER.

Probably no other country in the world, of like size, produces more good butter than the department of Calvados. Small villages in this region export to Paris large quantities of butter annually. The town of Isigny alone sends nearly 6,000,000 pounds every year. Gournay also sends 3,000,000 pounds.

FRESH VS. SALTED BUTTER.

We always have the Calvados butter on our own table, and find it excellent. The French do not use salt in butter, which seems rather strange to an American, but I am inclined to think that our people use too much salt in butter, as well as in many other articles of food.

MILKING QUALITIES OF THE NORMAN COW.

An ordinary Norman cow will give about 20 quarts of milk per day, while in some cases extra fine ones have been known to give 36 quarts in the same length of time.

I think it will be safe to say that an average Cotentin cow will produce 40 pounds of butter per month. This butter is probably worth in Paris 50 cents per pound the year through.

The accompanying cuts will give a better idea of the shape and general characteristics of this breed than any written description I could possibly give.

This race is sometimes crossed with the Durham, which certainly improves the appearance of the stock; but many of the French people believe, that for dairy purposes, the Cotentin cows cannot be improved by the admixture of any other blood.

However, there are those who contend that such crossing does not decrease the quantity or the quality of the milk. Some of these young Durham-Norman cows with the first calf have been known to give more than 20 quarts of good milk per day.

FEEDING AND HOUSING CATTLE IN NORMANDY.

In summer these milch cows feed on various kinds of grasses, including red clover. They do not run at large, as is the custom in the United States, but they are staked out in rows, across the fields, and can only graze to the end of their tether. After they have eaten everything within reach they are moved to a new position. This process requires

a little more care than we are accustomed to, but it is very important to economize in every way in a country where land is so valuable. In winter they are fed on hay, beets, turnips, carrots, cabbage, &c. A good cow is worth about \$75.

NORMAN BEEF CATTLE.

The Norman race is esteemed for the *boucherie*, but I am sure that it is greatly improved by crossing with the Durham stock.

The half breeds mature more rapidly, are larger, and of better form than the pure Norman. Bullocks for the market are chiefly fattened in the summer on the excellent pastures which abound in this province, and especially in Calvados and the Manche. This part of France produces abundance of beef for home consumption, and bullocks have been sometimes exported, principally to England.

The upland has a clayey, marly soil, and is well adapted to the various grasses. In the hilly regions we find abundance of flint, but the soil is quite productive.

VALUE OF BEEF AND BEEF CATTLE IN NORMANDY.

A good bullock on foot is worth about \$130. Fine specimens will sometimes sell for \$200 or more; but such animals are not often sold in this market. Beef cattle are worth about 10 cents per pound, on foot. This with the addition of octroi and other taxes, of course makes our sirloin steaks rather high priced. For choice cuts from extra fine bullocks we sometimes pay from 36 to 40 cents per pound. Good beef can be had, however, at from 24 to 30 cents per pound.

FRENCH VS. AMERICAN BUTCHERS AND BUTCHER SHOPS.

The French butchers handle their meats with the greatest possible care. I think our American dealers might learn something from the French in this regard. As a rule they are more careful in their selections of animals for the *boucherie*, and the result is that the beef is more uniformly good. Their shops are perfect models of neatness, and always as clean as they can possibly be made; cleanliness is next to godliness, especially in the dairy and the butcher shop. The French butchers allow their meats to hang much longer before cutting than our American butchers. I note this custom from the fact that I think it greatly improves the texture of the meat. Our American housekeepers ought to be a little more sparing in the use of salt. A new steak, well salted before broiling, is almost sure to be tough.

FRENCH VEAL.

It is not the custom in France to slaughter very young calves. They are rarely killed before they are three or four months old, and many of these weigh from 140 to 200 pounds net. *Veau* is always to be found in the markets, and is greatly esteemed by the French people.

IMPORTATION OF AMERICAN CATTLE INTO HAVRE.

Very few, if any, American cattle have been imported into this part of France. The chief difficulty in regard to the business is cost of

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transportation. Can this obstacle be removed? is the question. It would seem that powerful and swift steamers specially arranged for the trade ought to be able to carry beef cattle at such a rate as would leave a profit for the dealer. A Calvados bullock, weighing 1,500 pounds, is worth in this market about \$145. A like animal in Galveston, Tex., would probably be worth about \$60. This would leave a margin of \$85 for transportation, shrinkage, profits, &c.

This does not appear sufficient to induce capitalists to engage in the trade. Still I am of opinion that the time is coming when Europe must receive a large part of her beef cattle direct from the United States.

We have an unlimited quantity of the very best beef in the world, and a large portion of it ought to find its way into the mouths of the hungry millions on this side of the Atlantic.

I think, however, as indicated above, that freights must be considerably reduced before our live bullocks can be shipped at a profit from the Great West to any of the French ports. But the time will come.

EXPORTATION OF NORMAN CATTLE TO THE UNITED STATES.

So far as exportations from this country to the United States are concerned, it is not probable that they will ever be very large. A few choice Norman cows, strictly for breeding purposes, will be all that can be expected in this direction.

Accompanying this report will be found cuts of the various French breeds, especially those of the Northern part of France. These will be useful in comparing the different races, showing their form, &c.

JOHN B. GLOVER,

Consul.

UNITED STATES CONSULATE,
Havre, November, 1883.

CATTLE PRODUCTS IN THE DISTRICT OF THE MARNE.

REPORT BY CONSUL FRISBIE, OF RHEIMS.

I have the honor to acknowledge the receipt of Department's circular dated July 18, 1883, requesting information relative to cattle breeding, for the use and benefit of the stock breeders of the United States.

Immediately on receipt of said circular I began an investigation of the subject presented, with the hope that I should be able to prepare a report of some interest and benefit to the Department and to the stock breeders of the country; but in this I am sorry to say that I have not been successful, from the fact that the material out of which to make such a report does not exist in this district.

This condition arises from the fact, first, that the soil is light and chalky, and not suitable for growing grasses for pasturage, thus rendering stock-raising unprofitable; and, second, in the champagne district, of which Rheims is the center, the great industries are the cultivation of the vine and the manufacture of its product, and the manufacture of woolen goods, which leave little room for other enterprises of a less profitable nature.

So far as I am informed, there does not exist a single cattle market in this district. Beef is brought to this market already killed and dressed,

from Paris and other places at a distance. Butter for table use is brought from Normandy and other places, while the little which is made in this vicinity is fit only for cooking purposes.

Milk is largely brought to this market by rail from out-lying districts, that which is produced in the vicinity of Rheims being of an inferior quality.

JOHN L. FRISBIE,
Consul.

UNITED STATES CONSULATE,
Rheims, France, October 18, 1883.

CATTLE IN THE DISTRICT OF NICE.

REPORT BY VICE-CONSUL VIAL.

The ordinary breed, Taurus, is the single one to be found in the district of Nice. Neither beeves nor bulls are bred or fed in this part of France; cows alone receive the best care in the dairy for milk purposes, inasmuch as the milk is the chief food of a great many foreigners coming here during the winter. The beeves arriving in this town from Piedmont (Italy) are all reserved for the butcher. The best cow, the preferred, is called "Bergamase." This name refers to the town from which it is drawn, viz, Bergamus (Italy). It is a very stark cow, thick-set, dark chestnut, fine-haired, 4 feet high, always hollow-backed, with two large veins near the paps, one on each flank; giving an average daily quantity of 3 or 4 gallons of excellent milk. When wanting cows, the milkmen of Nice get the Bergamases from Lombardy (Mouza, Milan, Bergamus), and they choose them in the third year of their age, having just had their first calf or being still in calf. As Nice is surrounded by hills and as there are no large plains or meadows the plow is quite useless, and consequently no labor is required from oxen or cows. The best milkmen estimate that there are from 2,000 to 2,500 cows in the district of Nice. When bought in Lombardy a cow costs \$80 to \$90, but its transportation to Nice raises this cost to \$85 or \$95. Cows are conveyed hither by railway express, in wagons containing seven or eight. Six gallons of water and 18 pounds hay are their daily food in a journey of eighteen hours. The same ratio of food would be sufficient for the passage across the Atlantic, provided they be kept in appropriate stalls, 6 feet wide, 6 feet high, and 9 feet long. The daily food of a dairy cow is estimated at 44 cents.

No exportation takes place from Nice; the cattle crossing over this country is directed to a few small towns of the department of the Alpes Maritimes. They are generally driven on foot, unless long distances require railway express. From time to time Nice receives beeves for butchery either from Sardinia or from Algeria (Africa), but in small quantity and only when the importations from Italy become very scarce. Such animals give, however, but a middling quality of meat which can hardly be sold on the market, where the Piedmont cattle meat is always preferred.

A. VIAL,
Vice-Consul.

UNITED STATES CONSULATE, Nice, October 16, 1883.

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Switzerland, exported, in sesses two d said to be, in they are equ spectively:

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SWISS CATTLE.

REPORT BY CONSUL MASON, OF BASLE.

THE TWO PRINCIPAL RACES AND THEIR SUBSIDIARY BREEDS.

Switzerland, whose seventeen different kinds of cheese are nearly all exported, in greater or less quantities, to most civilized countries, possesses two distinct and noble breeds of cattle, each of which may be fairly said to be, in respect to certain essential qualities, unsurpassed, if indeed they are equaled, by any other bovine races in Europe. They are, respectively:

(1) *The Spotted race* (Fleckvieh), which has its origin in the valleys of the Simme, the Saane, and the Kander in Canton Berne, and is known by the name of "Berner spotted," or "Simmenthal or Saanenthal cattle." The principal off-shoot or subsidiary breed of this race is the "Freiburger Schwarzbvieh," from the adjacent canton of Friburgh, which is marked similarly to the Berners cattle, except that its spots are black instead of yellow or red.

(2) *The Brown Schwyzer race*, the origin of which is traced to Canton Schwyz, from which its name is also derived. This race is bred in its greatest purity in the central cantons of Schwyz, Uri, and Zug, and is distributed throughout the whole of Appenzell, Eastern and Central Switzerland, and as far west as the Canton of Argau. A few are also kept in the high valleys of the Jura and among the adjacent foot-hills, so that this breed must be included in any adequate account of the cattle of this consular district.

As to the approximate date at which these two principal races of cattle were first introduced into Switzerland, opinions differ. By many their presence here is believed to be coexistent with that of the present race of people, and there have been found among the remains of the prehistoric lake-dwellers skulls of oxen bearing horns and other marks peculiar to the brown Schwyzer cattle of to-day. It is generally believed that the Spotted breed of cattle, on the other hand, was derived originally from the Netherlands, and a resemblance is found between the Bernese animals and certain breed of Dutch cattle. But, whatever their origin, the essential fact is that the Spotted and Brown cattle races of Switzerland have been refined and improved by many centuries of careful treatment and intelligent breeding, and have become during the modern period of international expositions two of the most valued and important breeds in Europe.

SWISS IMPORTS AND EXPORTS OF CATTLE.

By reason of the limited area of this thickly peopled country, and the high values of its meadow and pasture lands, the cattle product of Switzerland is inadequate to its needs, and the animals which are annually imported for meat exceed in number, though not in value, the Swiss cattle which are exported in constantly increasing quantities for dairy and breeding purposes. There were in Switzerland, at the last census, 1,036,000 horned cattle, of which about one-half were milch cows.

The statistics of 1883 are not yet at hand, but the exports and imports of horned stock for 1881 and 1882 were, respectively, as follows:

IMPORTS.

From France.....	44,515
From Germany.....	42,768
From Austria.....	20,135
From Italy.....	3,082
Total neat cattle.....	110,500
Calves, all countries.....	1,150
Total for 1881.....	111,650
Total for 1882.....	116,000

EXPORTS.

To France.....	13,181
To Germany.....	20,188
To Austria.....	4,004
To Italy.....	19,865
Total.....	66,338
Calves.....	9,861
Total for 1881.....	76,199
Total for 1882.....	76,000

There were exported during 1881 and 1882 a few choice Brown cattle to the United States for breeding purposes, but as they were shipped via Antwerp, and therefore crossed the Swiss frontier into Germany, they are probably included in the registered exports from that country.

The beef cattle which are now imported into Switzerland from Germany, Austria, and Italy are mostly large, raw-boned, and rather coarse-looking animals, rough-haired, long-horned, and wanting in most of the essential points of highly bred stock.

PRICES AND EXPORTS OF CHOICE SWISS CATTLE.

The export of fine dairy and breeding cattle from Switzerland to adjacent countries, as well as to England and the United States, is increasing so rapidly that prices have advanced largely during the past two years. At a cattle fair in Sargans early in October of this year, I was told that the sales showed an average advance of 50 francs per head for all classes, as compared with values a year ago.

As early as August buyers from Italy and other countries appear in force in the mountain districts, and many of the choicest animals are picked up by them before the cantonal fairs of September and October begin, and it is claimed by good authorities that this increasing popularity of Swiss cattle in foreign countries and the growing practice of selling the milk from many dairy farms directly to large milk-condensing establishments is having a pernicious effect upon the cattle and the people of the rural cantons. On the one hand, the sale and export of so many of the choicest animals tends naturally to check the improvement of the stock; while, on the other hand, the daily sale of milk for a liberal cash price tempts the thrifty Switzer to work for immediate results rather than use part of his daily milk product in raising calves.

So that while the outflow of fine stock to other countries is increasing, the supply of such animals has not increased in due proportion.

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y, as follows:

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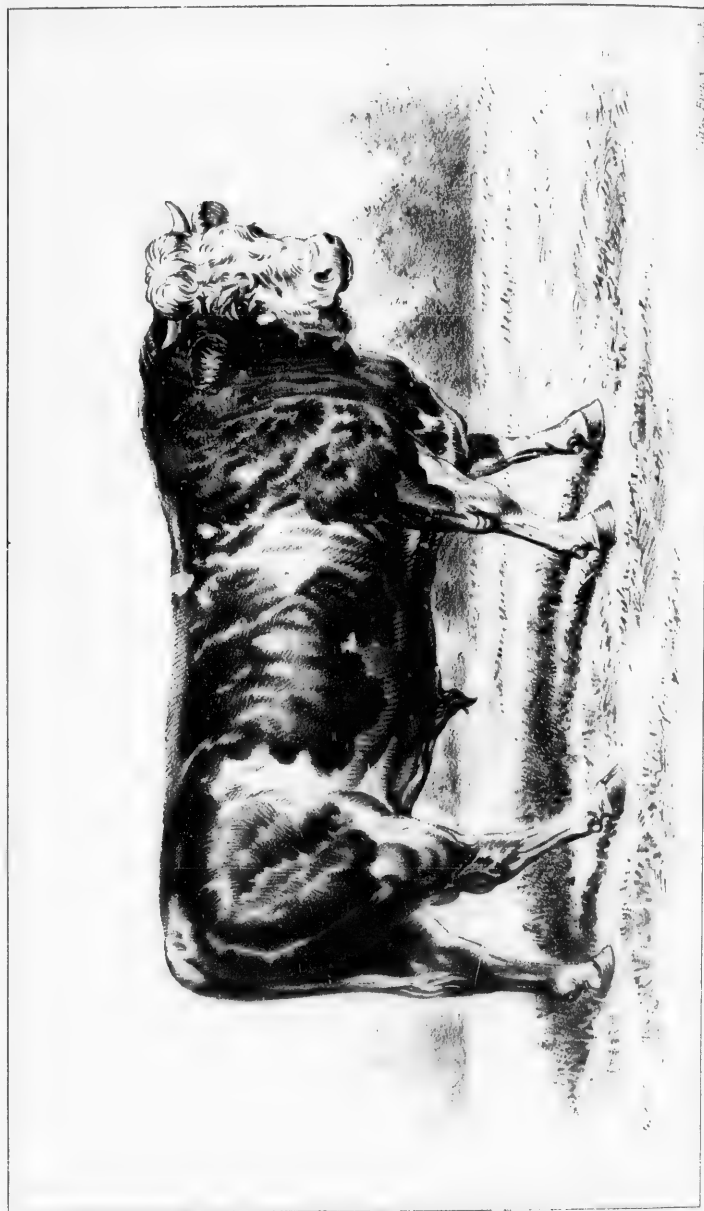
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Whether the Spotted or the Brown Schwyzer race of cattle is superior, and, on the whole, most profitable for the Swiss farmer, is a long disputed and still unsettled point, concerning which the inquiring visitor who consults cattle growers and dealers in the various cantons will receive some very positive and adverse opinions.

This much appears to be clear and beyond dispute, the Brown race is best adapted to the hill and mountain districts, and the heavier Spotted race to the valleys. The reasons for this will be readily apparent from a description of the two races.

DESCRIPTION OF THE BERNESE (SIMMENTHAL) CATTLE.

1. The cattle of this species prevail throughout the whole of Western Switzerland, from the valleys of the Bernese Oberland, where the purity of the stock is best preserved, to the slopes of the Jura, along the frontier of France. It is among the largest and noblest of European breeds, the average weight of the oxen ranging from 2,000 to 2,500 pounds, and a cow exhibited at Lucerne in 1881 having attained a weight of 2,494 pounds. This was, of course, an exceptional case, the average weight of thoroughbred Simmenthal and Saanenthal cows being about 1,400 pounds, though many choice herds average 1,700 pounds, and cows of 1,900 and 2,000 pounds weight are not uncommon.

The color is white, marked with large, irregular, and sharply defined spots or bars of red, yellow, or drab color. The color of these spots is a matter of fancy among breeders, in respect to which the *mode* changes from time to time. At present the light, yellowish-red tint is most preferred, and animals so marked command the highest prices. The other distinctive marks of this species are a small, well-formed head, light-red or white nose, large nostrils and mouth, small white or yellowish horns with brown tips, and gentle, kindly eyes. The neck is fine, that of the bull having a marked upward curve between horns and shoulders. The back is straight and broad, the tail long and thin, the legs round and well formed, small in proportion to the size of the animal, but muscular and strong, with white or yellowish-brown hoofs and dew-claws. The skin is smooth and the hair fine, glossy, and soft. In character this species is gentle, tractable, and easily managed, not over fastidious as to its food, but it requires good care, kind treatment, and warm stabling to develop its best capacities for milk, labor, or flesh-making.

THE BERNESE AS WORKING CATTLE.

As a working animal it is asserted by good authorities that the Bernese stands first among the cattle breeds of Europe, and it is easy to accept this estimate as fully justified by the facts. Its powerful frame, alert, active temperament, tractable disposition, and great endurance make it a model working ox, and most of the farm draft-labor of Central and Western Switzerland is performed by cattle of this breed; even the cows being used for such light work as hauling hay, bringing milk to market, drawing manure, &c.

THE BERNESE (SIMMENTHAL) AS MILKERS.

As milkers the Spotted cows stand in the front rank. At Roseck, the insane asylum of canton Soleure, I have seen a herd of twenty choice cows, kept by the cantonal government to supply the asylum with milk. From careful records, kept by Superintendent Marti, it appears

that these cows average 21 pounds of milk daily, or 7,665 pounds each during the year. This is a maximum record for an entire herd, and requires liberal winter feeding on grain, roots, &c., which is rarely practiced by the rural farmer. It will also be noted that these cows are stabled throughout the year, and, except during a few days in October, after the last grass is cut, they never graze.

The records of several well-conducted dairies in the wide basin between the Jura and Bernese Alps, where three hundred milking days are counted to each year, show an average yield of 23 pounds 14 ounces of milk per day from each cow, or 7,162 pounds for the year. These statistics have been carefully collected, confirmed, and published by Mr. B. Baugartner, member of the cantonal council of Soleure, and president of the agricultural association, whose long and intelligent labors for the improvement of Swiss stock and the general advancement of agricultural interests make him a high and recognized authority on such subjects.

In richness of milk, the Spotted race also ranks well. In the Alps, where the grass is savory and richest, 25 pounds of their milk yield a pound of butter; in the valleys, the quantity required for the same purpose varies from 28 to 30 pounds. Ten pounds of milk yield a pound of cured cheese, and besides this, in mountain dairies the herdsmen usually skim enough cream to make 1 pound of butter from each 100 pounds of milk without sensibly affecting the quality of the cheese. This so-called "Vorbruch butter" has, however, a strong animal flavor, and sells usually for 2 or 3 cents per pound less than ordinary butter from the same district. Something, of course, depends upon the quantity and the quality of grass upon which the animals are fed, but the above figures may be accepted as standard for well-bred Bernese cows kept on farms where meadows are manured, and irrigated in dry weather.

THE BERNESE (SIMMENTHAL) AS BEEF CATTLE.

As beef cattle it will be accurately inferred from the foregoing that the Bernese race holds the first place among the breeds of this country. They grow rapidly and are mature in their fourth year. They are of enormous size, compactly and cleanly built, and their flesh is fine-grained, tender, and savory. As such it is readily distinguishable, either in the butcher's stall or at table, from the coarse-grained, stringy beef which is produced by most of the imported "scrub" cattle with which Switzerland supplies the deficit in her meat product. Finer beef than is produced here from the stall-fed Simmenthal oxen I have never seen, either in England or the United States, and it may well be doubted whether better exists anywhere.

PRICES OF FINELY BRED BERNESE CATTLE.

The present market values of finely bred Bernese cattle, such as would naturally be selected for export, are indicated by averages of sales at several fairs during the present autumn, as follows: Calves, six months old, \$40; yearlings, \$80 to \$100; cow (four to five years old), \$130 to \$145; bull (two to four years old), \$130 to \$150.

A competent buyer, familiar with Swiss dialects and methods of "dickering," could go among the farmers and buy equally good cattle at perhaps 10 per cent. less than the above prices, which are the values current among dealers.

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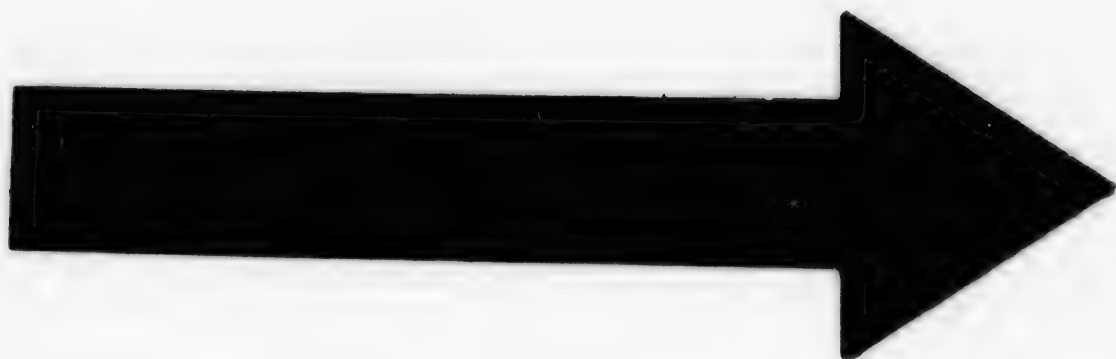
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Julius Pien & Co. Lith.

BLACK FREIBURG COW

BLACK FREIBURG COW



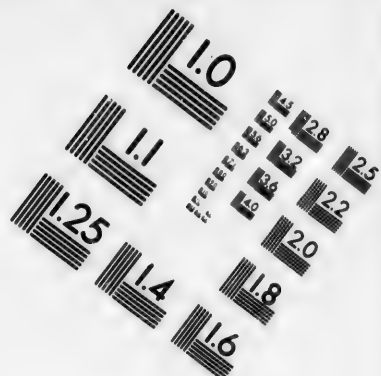
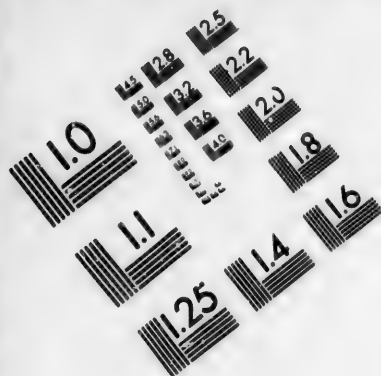
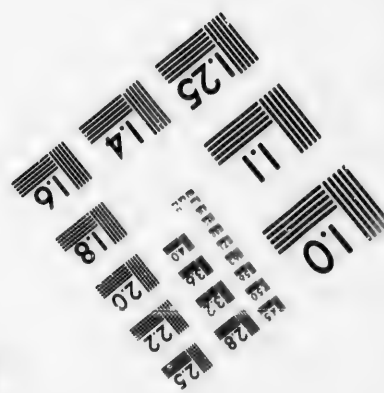
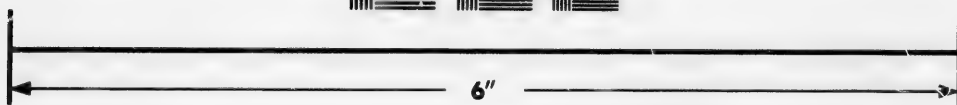
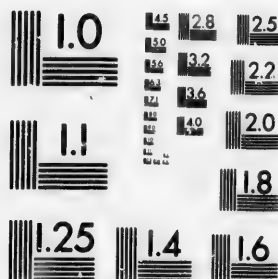


IMAGE EVALUATION TEST TARGET (MT-3)



Photographic Sciences Corporation

**23 WEST MAIN STREET
WEBSTER, N.Y. 14580
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Julius Ross & Co. Lith.

FREIBURG BLACK SPOTTED BULL

BERNESE COW

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BERNESE CATTLE SUITABLE FOR EXPORT TO THE UNITED STATES.

For export to the United States, the six months-old calves are recommended by experts here as being cheaper at first cost, easier and less costly to transport, and more likely to acclimatize readily than older animals.

BLACK-SPOTTED FREIBURG CATTLE.

There are several off-shoot breeds derived from the pure Bernese, known as the Freiburg, the Frutiger, the Illiez, and Ormond breeds, but they are all more or less inferior to the pure original race. As a principle, cross-breeding has failed in Switzerland, and the best results have always been obtained by in-breeding from the pure original stock.

Of these minor spotted breeds the only one which deserves notice here is the Freiburg, which originated in the canton of that name, and is still bred there in great purity, although even there it is gradually giving way in the best herds to the light-colored Saanen and Simmenthal variety.

The distinctive mark of the Freiburg cattle is found in the fact that their spots are black. Many examples are seen in which the entire animal is black, except perhaps the head and a stripe under the belly. It is fully as heavy as its Bernese rival, but has larger, heavier bones, coarser flesh, and is in other respects inferior to it in the technical points which characterize a perfect stock.

As working animals and as milkers the Freiburgs rank next to the Bernese, but for reasons stated they are less valuable for either the home market or export.

SIZE OF BERNESE AND FREIBURG CATTLE AT MATURITY.

Thoroughbred animals of both Bernese and Freiburg breeds attain at maturity the following dimensions: Length, 83 to 87 inches; height of shoulder, 55 to 60 inches; girth behind shoulders, 87 to 90 inches; weight, 1,600 to 2,500 pounds.

THE BERNESE—DURHAM CROSS-BREED.

For meat-producing purposes, a cross between the Swiss-spotted cattle and the English-Durham breed has been found excellent, but it is inferior for dairy and working purposes to the pure bred Simmenthaler and is comparatively little known.

BROWN SCHWYZER CATTLE.

As already indicated, the one other breed of Swiss cattle which challenges the supremacy of the Fleck race is the Brown Schwytzer, which has been bred for many centuries in the cantons of Schwytz, Uri, and Zug, and has spread thence throughout the whole mountain region of Switzerland. Its renown as a milker, its gentle disposition, and its ready adaptation to varying conditions of food and climate, have made the Schwytzer the better known, as it is no doubt the more largely exported of the two pure breeds of Swiss cattle.

As *milkers*.—The milk-producing records of choice herds of these cows have been carefully kept for centuries by the monks at Einsiedeln, and later at the milk-condensing establishment in Cham, both of which

will be so fully reported by the consul at Zürich that they may be omitted here.

DESCRIPTION OF THE BROWN SCHWYTZER CATTLE.

The Schwytzer cattle vary greatly in size. Some are nearly as large as the average animals of the spotted race, but there are other varieties which are kept in the high alpine districts, and which do not average more than 1,000 pounds in weight.

The standard Schwytzer cow has, however, a weight of 1,200 to 1,300 pounds, and is a remarkably perfect animal. The color most highly esteemed, as indicative of pure blood, is a dun or mouse color, fading to gray upon the back, and a strip of light gray or nearly white along the belly. The udder should be white, with large lacteal veins, the horns white two-thirds of their length, with tips of black. The ears are large and round, lined inside with long, fine fawn-colored hair; the tongue and nose are black, the latter ringed with a circle of light-colored hair, approaching nearly to whiteness on the lower jaw. The body is plump and compact, the back straight, the legs round, firmly set, and well muscled, with small black hoofs. The mountain-bred Schwytzer cattle climb like goats, and thrive throughout the year upon grass and hay alone.

These cattle have been exported to the United States and to all European countries, including even Russia; and they have proved entirely successful everywhere except in Spain. They work well under the yoke, but are smaller and less powerful than the spotted race, and for the same reasons they are likewise inferior to that race for the butcher. They are, in fact, bred principally for their milking qualities, and in that respect they are unsurpassed in the quantity and quality of milk which they produce from a given quantity of food.

MILKING QUALITIES OF THE SCHWYTZER CATTLE.

Trustworthy statistics show that a well-kept Schwytzer cow, fed on cut grass or hay, with plentiful pure fresh water, will yield an average of 10 quarts of milk daily during the entire year. At Cham, the 5,006 cows, whose milk is condensed by the Anglo-Swiss Company, yield 5,315 pounds, or $9\frac{8}{10}$ quarts each per day during the milking season, and these are only ordinary animals of the brown Schwytzer race. Choice herds, carefully kept, average at the best milking age, during April, May, and June, 12 quarts daily and even higher. The milk is of excellent quality, from 25 to 30 quarts of it yielding a pound of butter, and from 9 to 10 quarts a pound of cheese.

PRICES OF BROWN SCHWYTZER CATTLE.

Comparisons of sales at several fairs in Eastern Switzerland during the present autumn show the following prices for well-bred brown cattle of various ages:

Calves, six months old	\$40
Yearlings	\$80 to 100
Two-year olds	100 120
Cows, four to six years old	120 140
Bulls, three years old	120 150
Old cows	60 100

The prices charged by peasants at their farms would be 10 per cent. less than these figures.

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BROWN SCHWYZER BULL

Julius Ben & Co. Inc.



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Julius Brown & Co. Inc.



Julius Bruns & Co. Lith.

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BROWN SCHWYZER COW.

BROWN SCHWYZER HEIFER.

Julius Rensch, 1872

PLATE 11



BROWN SCHWYZER HEIFER.

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Adrian P. Brown & Co. 1880



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BROWN SCHWYZER HEIFER.



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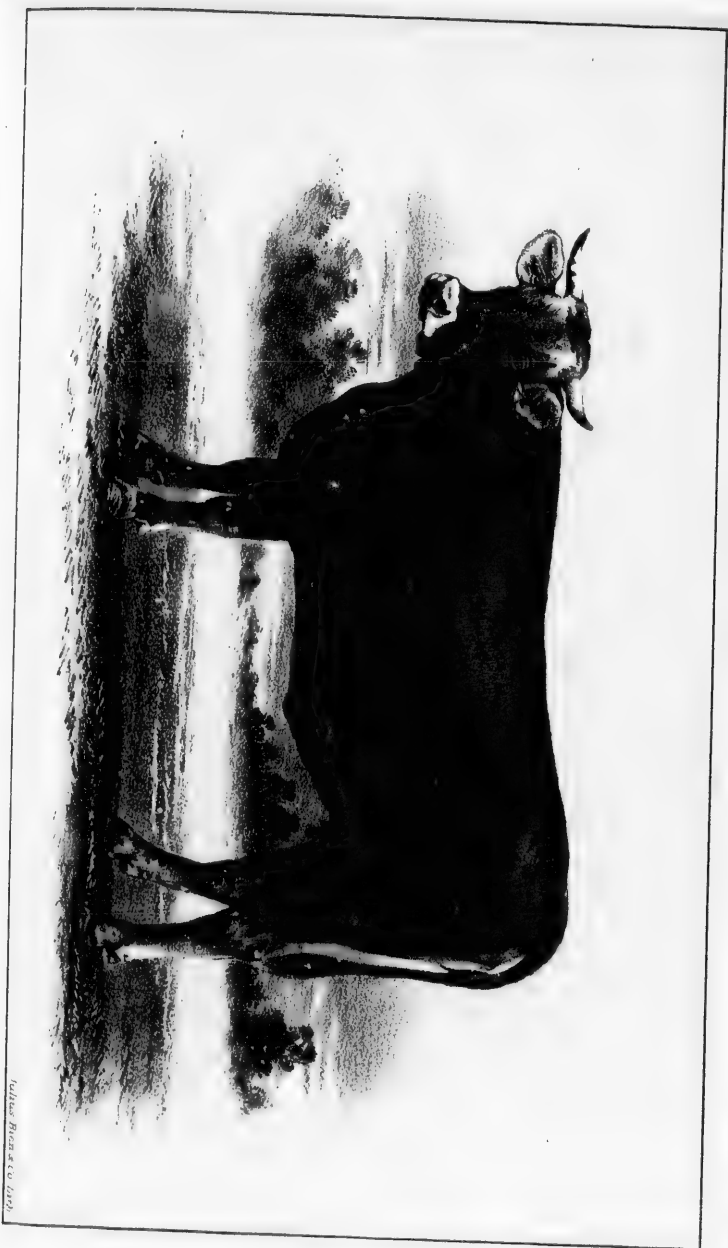
BROWN SCHWYZER HEIFER.

Julius Benck & Co. Lith.

BROWN SCHWYZER HEIFER.

Published by the
H. J. Brown & Co. Ltd.





BROWN SCHWYZER HEIFER.

Illustration by J. H. P.

SWISS BROWN COW

Alfred Brown & Co. Ltd.





SWISS BROWN COW

BROWN SCHWIZER BULL



Julius R. R. R. R.



Julius Punt 8/10/1913

The collector exhibits first prize breeds and pictures representing the two races in which the prize is given. As to the experience of the superiority of the dairyman.

The dairyman Mr. George P. Condensed Milk President of the many choice famous dairymen and instruments which to public institutions decidedly the superior.

In respect to the following the premium is the mean result of eight animals in

Bulls:
Bernese spotted...
Brown Schwytzer...
Cows:
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Brown Schwytzer...
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Bernese spotted...
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Length in these measures

HOW SWITZERLAND

It has been stated that the Swiss are the best cattle-growers in the world and supply a large amount of the milk which is earned by the country.

First. By reason of the high price of milk and in this country the competition of cheap foreign milk states have made it profitable to stock-grow.

Second. The present cattle industry enabled by the rich valley of the Rhone and the industrious care of the farmers enable him to raise a large amount of salable milk.

BERNESE AND BROWN SCHWYTZER BREEDS.

The collection of official photographs which accompanies this report exhibits first-prize cattle of the Bernese, Freiburg, and brown Schwytzer breeds at the national exhibition held at Luzern in 1881. These pictures represent in sufficient variety the most perfect specimens of the two races, and will fully justify and confirm the high estimate in which the pure-bred Swiss cattle are held by stock-breeders of all countries. As to which race is best for transplanting to the United States, experience only can determine, for even in Switzerland the palm of superiority between the two is still in dispute.

The dairymen at Appenzell, the clever monks at Einsiedeln, and Mr. George Page, the capable American manager of the Anglo-Swiss Condensed Milk Company, prefer the brown race.

President Baumgartner, whose experience and observation include many choice herds of both races in various cantons, as well as the famous dairymen of the Emmenthal, and a number of cantonal governments which have made elaborate experiments upon farms attached to public institutions, all these unquestionable authorities prefer decidedly the spotted race.

In respect to size, the merits of two races will be accurately shown by the following figures, which represent the average measurement of the premium cattle at a recent fair in Langenthal. The figures given are the mean result derived by measurements of from eleven to twenty-eight animals in each class:

Animals.	Height of shoulder.	Girth be- hind shoul- ders.	Length.
	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
<i>Bulls:</i>			
Bernese spotted.....	53½	70½	82
Brown Schwytzer.....	51½	76½	77½
<i>Cows:</i>			
Bernese spotted.....	55	81	84
Brown Schwytzer.....	52	77	80
<i>Calves before milking age:</i>			
Bernese spotted.....	52½	77½	81
Brown Schwytzer.....	49½	73	77

Length in these measurements means from the base of horns to the root of the tail.

HOW SWISS CATTLE ARE HERDED, HOUSED, AND FED.

It has been stated in former reports from this consulate that dairying and cattle-growing are each year becoming more important in Switzerland and supply a constantly increasing percentage of the gross income which is earned by the agricultural population. The reasons for this are:

First. By reason of uncertain seasons the small percentage of arable land in this country and its consequent high value, added to the competition of cheap breadstuffs from Hungary, Russia, and the United States have made wheat-raising much less profitable than dairy stock-growing.

Second. The present improved methods which prevail in the Swiss cattle industry enable the farmer to utilize every rood of accessible soil from the rich valleys to the highest pastures of the Alps and Jura, and the industrious care which he devotes to the feeding and raising of cattle enable him to realize the largest financial result from the smallest area of salable land.

The Swiss have not only two distinct breeds of the finest and most economically valuable cattle in the world, but they probably surpass every other people in the unwearied care and intelligent economy with which their animals are housed, milked, and fed.

Whether the farmer of the lowlands lives in a village or upon his land his dwelling and his stable are usually under the same roof. Great, roomy, and homely, but picturesque, structures they are, those houses and barns, covered by the same steep and projecting roof of red tiles, under the spreading eaves of which are stored the wagons and other farm machinery when out of use. That end of this building which shelters the family may be of wood, with picturesque balconies and exterior stairways; the upper part of the other half in which the hay is stored is not unfrequently built of squared pine logs or clapboarded, with large and frequent openings for ventilation of the hay, which is cut and thrown in fresh and fragrant, often almost without curing, in this rainy, cloudy climate, but the stable, that chief feature of the establishment, which underlies the hay-loft, is invariably built of stone, its solid walls of masonry being often 2 feet in thickness and plastered within and without. The heavy oaken stable-door fits into its casings like the cork of a bottle; the ceiling is as nearly air-tight as possible, and one or two small openings through the thick wall admit only a feeble glimmer of light to the dim interior. The floor is of plank or stone with a sunken section through the middle to catch the wet and waste, and heavy mangers or troughs along the sides receive the food of the cattle. The stables, for the most part often cleansed and kept with all practicable neatness, are almost entirely unventilated. In such stalls, in a close, noisome atmosphere, the cows on most lowland farms are kept day and night throughout the year except during a few days in late September and October, when, after the last crop of grass is mowed, the herd is turned out for a fortnight or two of grazing. This practice, however, is by no means universal among the dairymen of the valleys, many of whom never bring their cows out of the stable from one year to another, except, perhaps, for a few moments, when they are led to the adjacent trough to be watered.

Whatever else he may believe the Swiss cattle-grower never forgets that the prime requisites of economical dairying and meat growing are warmth, quiet, good, plentiful food, and fresh water for the animals, for warmth saves food.

A cow housed in a close, warm, dark stable wastes none of the fat or milk-producing elements of her food in needless exertion. She is protected from flies, from the goring and annoyance of other cattle, from the hot sun of noon and the chills of rain and dews as well as from the sudden flaws of bleak wind which even in midsummer blow at times from the snow-clad slopes of the higher Alps.

There are, of course, throughout the whole mountain region of Switzerland high valleys and steep pastures to which the cattle are driven in May or June and graze until the end of the brief summer. But even there the same zealous and intelligent care is taken to protect the animal from every contingency of weather. The chalets on the lofty meadows which look so picturesque from the valleys below, are, for the most part, cow-houses built of squared logs or planks carefully chinked with clay or moss, and constructed, like the barns for winter, in the most careful and substantial manner. I have counted nine layers or thicknesses of shayed pine shingles in the roofs of these chalets, so carefully are they constructed to exclude the damp and cold. There is often a fireplace between the stalls at the end opposite the door, and there the mount-

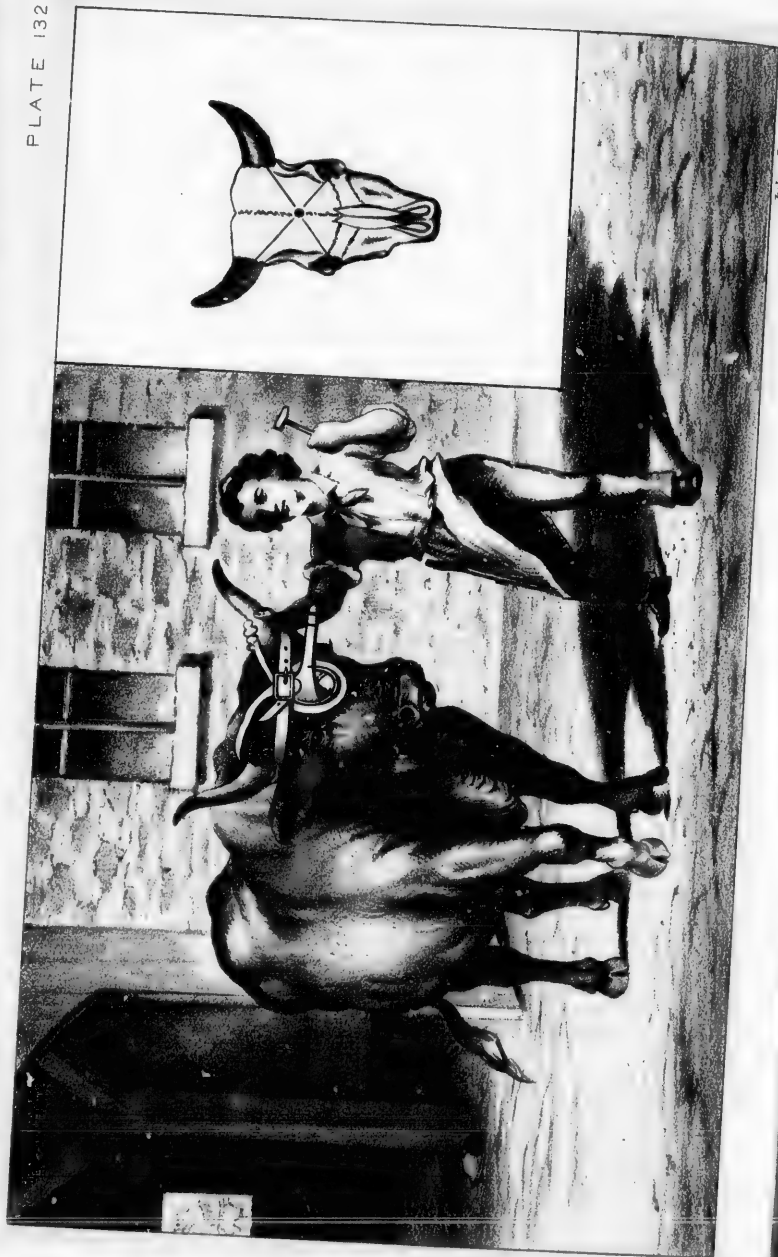
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John H. Brown & Co. 2112

herdsman lives and the morning is fair, the short, sweet morning bringing in a supply of good weather; but if his horn, is heard. Naturally purely bred, daily like well-kept for, and never beaten, tions perfectly domestic, now seeking to improve, port Swiss herdsman, valuable in more than the shambles are led into crowded cars, markets and abattoirs, last moment of their

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MEAT PRO

The following interesting pose at the Basle abattoir weight of a number of catt

herdsman lives and sleeps with his cows from spring until autumn. If the morning is fair and the sun warm he turns them out to graze upon the short, sweet mountain grass, and busies himself with mowing and bringing in a supply that will serve to sustain his herd during night or stormy weather; but at the first approach of cold wind or rain his *jodel*, or his horn, is heard and the cows hasten to their accustomed shelter. Naturally purely blooded cattle treated in this way, curried and brushed daily like well-kept horses, trained to be led and handled, always cared for, and never beaten or abused, have become in the course of generations perfectly domesticated. If the American stock-growers, who are now seeking to import Swiss cattle for breeding purposes, will only invaluable in more than one respect. Even the fat oxen on their way to the shambles are led in pairs like horses, and instead of being jammed into crowded cars, mauled through the streets to noisome, muddy stock-yards and abattoirs, they are carefully and humanely treated until the last moment of their lives.

THE SWISS SYSTEM OF SLAUGHTERING.

The arrangement for slaughtering cattle in the city of Basle is so perfect that a brief allusion to it may be pertinent to the object of this report.

On the Rhine bank, below the city, is a large, newly-constructed abattoir, built by the city government and placed under the care of Director Siegmund, an accomplished veterinary surgeon, who inspects all animals before they are allowed to be slaughtered, and controls all the processes of preparing the meat for market.

Dr. Siegmund has invented and put in use at this establishment perhaps the most perfect and merciful instrument yet constructed for killing cattle.

It consists of a mask or plate of iron, which fits the forehead of the animal, and is readily attached by straps which are fastened round the horns. In the center of the mask is fixed a steel gun, 10 inches long and of about .38 caliber, the breech being outward and provided with a steel needle, which, on being struck with a small hammer, explodes the ordinary metallic cartridge with which it is loaded. The barrel is fixed at such an angle to the interior surface of the mask that the bullet pierces the center of the brain and is buried in the spinal marrow, producing instantaneous and painless death. With tame, quiet cattle, a form of this implement is used which is not bound to the head, but simply applied to the forehead and fired. In either case the result is the same. The ox walks without fear or apprehension to the shambles, a touch is given to the fatal needle, and the huge creature drops, utterly dead and incapable of suffering. The bleeding afterwards is perfect, and thus the only excuse that can be decently urged for killing cattle by long and painful methods is met and overcome.

Compare this instantaneous process with the barbarous methods in use elsewhere, of pounding cattle on the head with a sledge or swinging them up alive by a hind leg to bellow and struggle until they bleed to death.

MEAT PRODUCT OF VARIOUS CATTLE.

The following interesting statistics, which were collected for this purpose at the Basle abattoir, will show the origin and live and dressed weight of a number of cattle recently slaughtered there, together with

the weight of hide, tallow, and percentage of dressed to live weight in the case of each animal:

Nativity.	Hide.	Tallow.	Live weight.	Dressed weight.	Percentage of dressed weight.
	Pounds.	Pounds.	Pounds.	Pounds.	
Austria.....	128	100	1,820	1,020	56
Do.....	127	114	1,518	864	57
Do.....	94	126	1,330	840	61
Italy (Piedmont).....	102	146	1,394	827	59
Do.....	101	162	1,670	910	55
France.....	90	130	1,422	800	56
Do.....	85	88	1,250	741	59
Do.....	106	60	1,250	756	60
Switzerland.....	106	100	1,570	902	57
Do.....	124	60	1,550	922	59
Do.....	103	95	1,440	875	61
Do.....	117	50	1,324	862	65
Do.....	110	68	1,340	798	59
Do.....	112	65	1,340	818	61
Do.....	145	90	1,400	855	61

From statistics furnished to Mr. Page, superintendent of the Anglo-Swiss Condensed Milk Company at Cham, it appears that the average weight of dressed meat derived from oxen of the Brown Schwytzer race is 850 pounds. An ox of this race weighing alive 1,650 pounds should yield 880 pounds of salable meat, or 53 per cent. of the live weight. Swiss cattle, particularly of the Brown race, are rarely *thoroughly* fattened, and many of the animals sent to the butcher are discarded cows.

ARTIFICIAL FEEDING.

The subject of artificial feeding is too elaborate and unsettled to be fully discussed in this report, and the materials used here differ so greatly from those used in the United States that this comparison loses much of its practical importance. By far the greater number of Swiss farmers feed nothing but cut grass and hay at all seasons.

Artificial feeding, of course, increases the quantity of milk, particularly in winter, but most Swiss assert that it injures its quality.

THE FEEDING OF CALVES.

In the raising of calves the best approved method recommends, as the daily portion of food, 3 liters (quarts) of milk during the first week, 4½ quarts daily during the second week, 6 quarts during the third week, 7½ during the fourth, and thence to the eleventh week 9 quarts per day. During the fourth week the use of corn or oat meal is begun; also oats in the kernel, commencing with a half pound per day, which is gradually increased to a daily portion of 1½ pounds of corn or oat meal, and also the same quantity of oats and a like weight of dry hay, and this regimen is maintained until the calves are six months old, when they may be treated as adult cattle.

TRANSPORTATION OF SWISS CATTLE TO THE UNITED STATES.

Live cattle are not generally regarded as really desirable freight on the first-class passenger steamships, and the rates charged by them for such transportation are high. The North German Lloyd line charges \$100 per head from Bremen to New York, and \$80 per head from Bremen to Baltimore. These rates include food and water for the animals

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Annual average pro
Quantity of milk to
Quantity of milk to
Dimensions of cow:
Length.....
Height.....
Dimensions of bull:
Length.....
Height.....
Weight at maturity:
Cow.....
Bulls and oxen..
Age at maturity:
Cows and bulls..
Oxen.....

Principal market
Habitat.—Centr
Color.—Bernese
Schwyzer: Brown
How long bred pu
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Origin.—Bernese
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Working qualitie
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Principal markets.
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Other varieties.—T
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varied colors.

live weight in

Dressed weight.	Percentage of dressed weight.
Pounds.	
1,020	56
864	57
840	57
827	61
910	59
800	55
741	56
750	56
692	57
923	59
875	60
802	61
796	65
818	59
855	61

during the voyage. The Bordelaise steamship line charges \$80 per head from Bordeaux to New York. But the White Cross steamship line offers the following rates for live cattle from Antwerp to New York or Boston: Adult cattle, per head, \$39; yearlings, \$34; calves, \$30.

These charges include also food and water for the animals during the voyage, and free passage for the necessary men in charge of them. If the cattle are unattended, an extra charge of \$1 per head is made for feeding and care during the passage. A car-load of cattle from Basle to Antwerp costs about \$55, and as a car will carry from ten to twelve head of ordinary sized cows, the net cost of transportation from here to New York or Boston can be very closely estimated.

The importation of fine breeding cattle is, of course, expensive under even the most favorable conditions, but the economic advantages of establishing the Brown and Spotted cattle races of Switzerland in the United States would seem to be so obvious as to fully justify whatever expenditure such enterprise may involve.

FRANK H. MASON,
Consul.

UNITED STATES CONSULATE,
Basle, November 22, 1883.

SWISS CATTLE STATISTICS.

[Inclosures in Consul Mason's (Basle) report.]

Bernese Spotted (Saanen Simmenthal) breed.

Description.	Bernese Spotted.	Brown Schwytzer.
Annual average product of milk	7,162 to 7,665	7,000 to 7,454
Quantity of milk to 1 pound of butter	26 to 30	29
Quantity of milk to 1 pound of cheese	9½ to 10	10½
Dimensions of cow:		
Length	84	80
Height	55	54
Dimensions of bull:		
Length	86	78
Height	56	54
Weight at maturity:		
Cow	1,400 to 1,700	1,200 to 1,500
Bulls and oxen	2,000 to 2,500	1,400 to 1,800
Age at maturity:		
Cows and bulls	4	4
Oxen	5	5

Principal markets: Cantons of Uri, Schwytz, and Zug.

Habitat.—Central and Western Switzerland.

Color.—*Bernese Spotted:* White, with light red, yellow, or dark-red spots. *Brown Schwytzer:* Brown or mouse color; bulls darker, same color.

How long bred pure.—*Bernese Spotted:* Many centuries. *Brown Schwytzer:* Since before authentic history.

Origin.—*Bernese Spotted:* Possibly Holland, but the race has been refined and improved in Switzerland. *Brown Schwytzer:* Canton Schwytz, Switzerland.

Working qualities.—*Bernese Spotted:* The best working race of cattle in Switzerland; believed to be unsurpassed in Europe. *Brown Schwytzer:* Works well in yoke, but is not bred for that purpose.

Principal markets.—*Bernese Spotted:* Erlenbach, Sannen, Zweisimmen. *Brown Schwytzer:* Cantons of the Schwytz and Zug.

Other varieties.—The Fribourg breed is similar to the *Bernese Spotted*, but has black spots. Minor breeds of Spotted Swiss are (1) Frutig Adelboden; color, red and white; principal market, Reichenbach, Canton Bern; (2) Walliser, smaller, varied colors.

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STATISTICS OF BROWN SCHWYTZER CATTLE.

REPORT BY CONSUL BYERS, OF ZURICH.

In compliance with the Department's circular of July 18, I transmit tabular statements as to certain Swiss cattle best suited for importation and breeding in the United States.

In addition to these tables, I wish to offer some remarks that may be of interest to cattle breeders who are intent on securing only the very best breeds of milch cows.

First, I would like to call attention to my report on "Swiss dairy thrift," printed in No. 22, of Consular Reports; also to my report on "Milk condensing" in Switzerland, in Consular Report No. 27. I refer to these in order to save too much repetition of the same facts in the present report, though some repetition will be necessary for convenience.

The information contained in the tabular statements, I may premise, are believed to be very authentic and trustworthy, as they are compiled for me by some of the best cattle-growers in the country.

As remarked in a previous report, Switzerland has been famous for the productions of its dairies for centuries. At the international cattle show in Paris, in 1878, every Swiss cow exhibited bore away a prize. The result of exhibiting Swiss cows has been almost as favorable at other fairs in Europe, and especially at the great cattle show of Hamburg, recently closed. The Brown Schwytzer race of cows has, within a few years, or rather since Switzerland has commenced exhibiting at international shows at all, borne away premiums from Holland, England, Denmark, and other famous cattle-producing countries.

These Brown Schwytzers are not a new race of cattle, suddenly discovered to be of great value for the dairy. On the contrary they were known for their good qualities long ago, and the breed has, in certain districts, been kept pure for several centuries. The Brown Schwytzer is a native of Switzerland, and has its name from the canton of Schwytz, where the race has been bred longest, and where the purest blood is found to day.

The leading characteristics of this cow are—

- (1) Its good milking qualities.
- (2) Its perfectly mild disposition.
- (3) Its adaptability to most climates and localities.
- (4) Its great beauty of form and color.

THE BROWN SCHWYTZERS AS MILKERS.

A good Brown Schwytzer will average, for three hundred and sixty-five days in the year, not less than 10 quarts of milk daily, and that on grass and hay alone. This is not the exceptional rate, resulting from special care and special feeding, but the good average of thousands of these cows, taken from whole herds. I shall avoid entirely here any reference to special cases of extraordinary milk production, as being useless and misleading. I take it that what our farmers wish is facts as to what an *average* good Swiss cow will produce, not for a few months only, but for every day in the year.

Fortunately, there are some reliable records to be had, showing just about what this average production is. I quote, first, from my report on "Swiss dairy thrift," some statements based on recorded experience of

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the "Anglo-Swiss Condensed Milk Company" at Cham. Perhaps no more reliable statistics as to milk production exist in the world than the books of this company. It is, in short, the largest milk-condensing company known.

It uses the milk of not less than from five to six thousand cows at the principal factory in Switzerland, and of as many more at the company's condensing establishments in England.

The company's director, Mr. George H. Page (an American), feeds (as private property) the very finest herd of the Brown Schwytzer cows I have found in the country. Mr. Page keeps his herd of thirty cows in a large rectangular house, with brick walls and tile roof. The very broad ceiling is unsupported except by outer walls. It is very high, and the whole immense room where the herd stands is plastered throughout, and furnished with every modern improvement as to mangers, floors, ventilation, &c. This fine herd ranges in age from three to five years, few being over three years, and the cows average in weight 1,400 English pounds. One of them, a four-year-old (an exception of course), weighs 1,810 English pounds. The cows of this herd are, perhaps, in all respects above the average of Schwytzer, as they were mostly choice selections, and paid for accordingly, at prices reaching in single cases \$200 to \$240.

Mr. Page feeds only grass and hay, summer and winter, and that is worth bearing in mind. His cows are taken out to exercise daily, but never graze. Twenty-six of these three-year-old heifers produced in April, May, and June (after first calf) 28,076 liters of milk, or 12 quarts per cow daily; a large average when it is remembered that it includes almost every cow in the herd, and that none were at the best milking age. Mr. Page counts on these twenty-six cows averaging 15 liters daily, this coming year 1883. Three of the two-and-three-fourths year old heifers gave at highest points 19½ quarts daily, and averaged 10 quarts the year through. Three others, after second calf, gave 24 quarts daily for three months, and maintained a high average throughout the year. It will be most interesting to see the coming year's record of these Swiss cows stabled and fed on common-sense principles. The reports of the milk and butter of the many thousands of cows contributing to the condensing factory of Cham are most interesting.

In the year 1881 the condensers used the milk of between 5,000 and 6,000 grass and hay fed cows. They were milked about nine months, and produced on an average 5,315 pounds of milk per cow; that is, 19.7 pounds or 9.8 quarts of milk per cow daily, for the milking season.

In England, last year, 5,000 to 6,000 of the famous Shorthorn cows furnished to the English branch of the establishment an average of 4,668 pounds milk per cow for the milking year, showing a difference in favor of the Swiss cows of 647 pounds of milk per year.

The English farmers add oil cake, roots, and other artificial food to the hay of the cows, but they do not stall them so warmly in winter. In general, the milk supply is better in Switzerland in winter than it is in England. According to the report of the Department of Agriculture of the United States in 1875, the highest average of milk received at the best dairies of the State of New York reached 4,008 pounds for a high-fed cow in the year, a difference in favor of Swiss cows, without extra food, of 1,307 pounds per year. The average of fat contained in the milk of these thousands of Swiss cows is 3.3 per cent., though single cows show 4 to 4½ per cent. fat, or oil, in the milk.

The terms "fat" and "butter" are used synonymously, for while there is more butter than fat or oil contained in the milk, the butter cannot

be taken away wholly, hence the amount obtained about equals the fat. It is found that something less than 31 pounds of milk is required to produce 1 pound of butter. At this rate, the Swiss hay-fed cows furnishing milk to the Cham Condensing Company could produce, on an average, say 175 pounds of butter to the cow for the season; an average that would bear most favorable comparison with the average butter of 6,000 high-fed cows of the State of New York.

At the celebrated monastery of Einsiedeln, in Canton Schwytz, a careful record is also kept of the product of the cows.

One hundred and twelve head of cattle are kept at the monastery. Of these, fifty-seven are Brown Schwytzer cows. They receive no feed except grass and hay, the year through. The average of milk is 10 liters per cow, the whole year through. The highest quantity reached is 20 liters daily, given by some twenty cows of the fifty-seven, in the months of May, June, and July.

The cows calve mostly in autumn and spring. The latter season is preferred. At present, July 6, more than half the cows are herded on the Upper Alps. They were taken up in May and will come down in September. The milk, while up there, will average much less, but it will be excessively rich, owing to the sweetness of the short and scarce Alpine grass. Only the lighter cows are sent up on the Alpine slopes. Their milk, while there, will be made into butter and cheese in the little stone huts of the herdsmen, or "Senns," and these will be brought down in the autumn, when there will be a village festival in their honor. The cloister keeps five hands only for the one hundred and twelve head of cattle. These do all the feeding, grass-cutting, milking, &c. The wages paid them are very low; in summer 6 francs a week only, and board. Board is as follows:

Breakfast: Coffee, milk, and bread. (No butter.)

Dinner: Soup, wine, meat, vegetables, and bread. (No meat Fridays and fast days.)

Supper: Soup, potatoes, and bread. Potatoes changed for meat, half the evenings.

They work from 4.30 in the morning till 7 in the evening. One man can milk twelve cows in one and a half hours. In winter one man is expected to attend to fifteen cows.

Good cows of Einsiedeln sell readily at from \$100 to \$125. Even \$150 to \$200 is not so rare a price. These are not fancy prices. They are given because the cows warrant the investment. Good young Schwytzer bulls at Einsiedeln are worth about \$150. One of the cloister bulls, three years old, which took second premium at Lucerne cattle fair, is valued at \$200. He was worth \$250 at two years old. At three to four years old bulls are sold to the butcher. Most of the Einsiedeln calves are raised. The poorer ones are sold at two weeks old to the butchers, and bring about \$6. Only one opinion prevails at Einsiedeln as to feed for milch cows. Quantity of milk may be, and is, increased by artificial feed, but the quality they claim, as do most dairymen in the country, is reduced.

Farmer L—, in the neighborhood of Einsiedeln, gave me the record of his herd of some twenty-five cows. He has been keeping milch cows on this farm for fifty years. The average of result was not materially different from the average of other small and select herds. His cows give 10 liters of milk each daily, year in, year out. He has what is a great exception, well-ventilated cow-stalls. He gives the usual allowance of hay, viz, 30 pounds daily to the cow, and a spoonful of salt every other day. He also adds bran and shorts to grass—a rare exception. All his milk goes to neighboring factories, and is paid for at the stalls when milked at 4 cents a quart. His fine herd average about 1,300 to 1,400

pounds in weight. It seemed unusual to find it into the yard.

At or near the end of the milk of seven cows daily, or about 850 quarts daily, or 3.2 cents, the Cham

The Cham cows give 2.6 cents, per quart.

A fair average of 10 quarts daily, course this average is especially in the quality is for the Brown

In appearance mouse-colored is the stock to straight back horns, tipped with an abundance short and powerful nose black with The udder is large. Owing to the fact that she really will average 1, she is as handsomely panning cuts a and appearance.

Ordinarily, the cow is fed only grass. At least, is always are usually low dark. They are almost as well as dried and cleaned and put into the

FEED.

By extreme care in growing, and preventing crops are secure grass harvests valued at \$300 a piece; and yet Swiss farmers get milk at cheaper rates. Naturally, the good farmers make on

pounds in weight. They are never out of the stall, not even to water. It seemed an unusual occasion for them when he had them all led out into the yard for my inspection.

At or near to Thalweil, I secured the statistics of a dairy using the milk of seventy-five cows. These seventy-five cows furnished 700 quarts daily, or about 10 quarts each, year in, year out, not counting the milk retained at home for the use of the families owning the cows. In July, \$50 quarts daily are sent to the dairy. The milk is sold at 16 centimes, or 3.2 cents, the liter at this place, when not made into cheese.

The Cham Condensing Company pay the farmers 13½ centimes, or 2.6 cents, per quart or liter of 2 pounds.

A fair average for Schwytzer cows in Canton Zurich would be about 10 quarts daily for three hundred and sixty-five days in the year. Of course this average differs in the different districts of the country, and especially in the mountainous cantons, where the product is less, though the quality is considerably richer, owing to the sweeter grass. So much for the Brown Schwytzer as a milker.

CHARACTERISTICS OF BROWN SCHWYTZERS.

In appearance, the Brown Schwytzer is not really brown at all, but mouse-colored, and the nearer she is to the mouse color the more likely is the stock to be pure. She is round and plump in form, with very straight back; has sleek hair, large, mild, black eyes, smooth, white horns, tipped one-third their length with black. Ears large and lined with an abundance of white or cream-colored hair. The neck is rather short and powerful; breast deep and broad; the head is finely shaped; nose black with white ring about it; tongue also very black and rough. The udder is large, well shaped, and quite white, milk veins very prominent. Owing to her general plumpness of figure, she looks some smaller than she really is, as she is in fact a large cow. Her ordinary weight will average 1,000 to 1,400 Swiss pounds, and often more. Altogether, she is as handsome a cow as exists anywhere in Europe. The accompanying cuts and photographs give a fair representation of her form and appearance.

Ordinarily, though there are single exceptions, the Swiss cows are fed only grass and hay, summer and winter, and this, in the valleys at least, is always carried to them in the stalls. The Swiss cattle stalls are usually low stone houses, with little or no ventilation, and are almost dark. They are kept very clean, however, and the cattle are cared for almost as well as Americans care for fine horses, many being even curried and cleaned daily. Every pound of manure is saved in a reservoir and put into the meadows in liquid form.

FEEDING AND CARING FOR BROWN SCHWYTZERS.

By extreme care of meadows in the way of manuring, draining, watering, and preventing stock trampling them, large and excellent grass crops are secured; and, aided by a moist and temperate climate, three grass harvests are obtained yearly. In Canton Zurich grass land is valued at \$300 per acre, and good Schwytzer cows at from \$125 to \$150 apiece; and yet, by their unusual care of both meadows and cattle, Swiss farmers earn from 8 to 10 per cent. on the investment, and sell milk at cheaper rates than are demanded anywhere in the United States. Naturally, the query is repeated, What profits might Western American farmers make on milch cows, with land at \$50 an acre and cows at \$40

apiece, were the same care taken of cows and meadows in America as is taken in Switzerland?

Only two items in the list are against us, viz, dearer labor and "scrub" races of cows.

The former is outbalanced by the dearer land in Switzerland, and as to the "scrub" cows, it is our own fault if we continue milking them. They cost as much to feed and to breed and to milk as good cows, and the profit on them is not nearly as much.

BROWN SCHWYTZERS IN THE UNITED STATES.

It is worthy of remark here that certain Americans in the Eastern and New England States have been trying these "Schwytyzer" cows on Yankee soil for the last ten years, and, as I am informed, with the most satisfactory results. Otherwise, some of these same breeders would not have been in Switzerland in this year 1883 adding to their stock of Brown Schwytzers.

There is at Worcester, Mass., I think, a society called the "Brown Swiss Breeder's Association," and a "record" or "herd-book" of the Swiss cows bred and owned by them has been published. As this society is increasing its herd of Schwytzers, it would seem conclusive proof that this race of cattle takes well to the climate and the soil of the United States.

The first Swiss cattle breeder and dealer to send Schwytzers to the United States was Landammann Bürgi, of Arth, Canton Schwytz. He is still in the business, and breeders and importers of cattle cannot do better than to correspond with him directly. Mr. John Bruppacher, of Rüschlikon, Canton Zurich, is also engaged in delivering Swiss cattle to foreign countries. Still another dealer and breeder is Mr. Berg, at Schwytz, who owns a fine herd on the Frohn Alp, by Lake Lucerne; also Mr. Giger, of Ragatz, who breeds and sells cattle.

THE BROWN SCHWYTZERS IN EUROPEAN COUNTRIES.

Within a few years the sale of the Brown Schwytzer cow to other countries has been on the rapid increase, and prices have gone up from 50 to 60 francs on a cow in a single year. The principal countries importing these cows have been Italy, Germany, and Russia.

Small numbers have been taken to England, America, and Spain. With the exception of Spain, I have heard only satisfactory reports as to the results of these importations, even where climates and soils differ so widely.

MARKET VALUE OF BROWN SCHWYTZERS.

A year ago I reported to the Department that Brown Schwytzers were being exported quite largely to Italy, Germany, and elsewhere, and that the prices for the same were rapidly rising.

Within a few days, by attending cattle markets at Ragatz, Sargans, and points in Appenzell, I have collected material as to prices obtained at absolute sales, and I find the average market value constantly rising, though checked at present, of course, by approaching winter and rainy days at the market towns. The prices demanded varied immensely, regular dealers demanding 20 per cent. more than did the farmers for the similar stock.

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Yearling bulls

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In the neighborhood of Ragatz, Vason, Mayenfeld, and down towards Canton Zurich, prices for Brown Schwitzer cattle average about as follows:

	Francs.	
Yearling steers	300	to 600
Two-year-old steers	500	700
Yearling heifers	200	300
Cows with calf	500	900
Young cows	500	800
Old cows	300	400
Yearling bulls	700	800

One and a half year old bulls, 900 to 1,200.

Good six months old calves, about 200 francs.

At a Sargans market this month I found prices considerably lower than those quoted above; they vary in fact in the different valleys materially, and at different seasons of the year.

I purchased for Americans, last August, in Canton Zurich, a number of fine four and five year old cows, at 650 to 800 francs each, and for a year and a half old bull, 1,000 francs was paid.

They were all select cattle.

HOW TO EXPORT SWISS CATTLE.

The freight from Zurich to Antwerp per car load is about 300 francs.

The freight on cattle per "White Cross line" from Antwerp to New York, or to Boston, is as follows:

	Per head.
For grown cattle	£8
For yearlings	7
For calves	6

The foregoing includes water and feed on shipboard. The men accompanying the stock have free passage. If no men accompany the stock the ship company provides hands for the purpose, and an extra charge of 4 shillings per head is made.

In short, the cost of transporting full-grown cattle from Zurich to New York may be reckoned at very nearly \$50 per head, and for yearlings, \$40.

S. H. M. BYERS,

Consul.

UNITED STATES CONSULATE,
Zurich, October 23, 1883.

SWISS CATTLE AND DAIRY PRODUCTS.

REPORT BY CONSUL BEAUCHAMP, OF ST. GALLE.

GOVERNMENTAL ASSISTANCE TO SWISS CATTLE-BREEDERS.

Switzerland claims for herself one of the first positions among the European states with regard to her cattle, milk, and the products thereof. The principal breeds are widely known in Europe and their origin dates with the beginning of Swiss history. As breeders they are much sought after. When a farmer or cattle-raiser in Germany, Italy, or France wishes to improve his breed he generally makes a selection from a Swiss herd, for experience has long since been made that Swiss

cattle, reared and grazed on Alpine grass, with plenty of fresh running water and pure air, are the healthiest and hardiest known to the herd-book.

The Swiss breeder pays great attention to "pure bloods," and is very careful that no "cross" occurs, which accounts for so many "pure-bloods" one sees in the Swiss herd book. As a rule only the finest formed and best marked animals are kept for breeding purposes, and the result is that the quality of Swiss cattle is yearly improving. To encourage farmers and breeders in this respect the various cantonal and district governments in Switzerland offer premiums in stipulated sums to be awarded at the county and district fairs, which are held in the spring and fall of each year. This system of governmental recognition and assistance is a great stimulant to breeders of pure bloods, and beyond cavil a proved success. In the award of premiums the greatest care is taken by the judges in considering all points, and the least defect as to color, form, size, &c., often proves disastrous to the exhibitor, and the consequence is that the farmers and breeders are always on the *qui vive* that their pure-bloods reproduce themselves in their offspring. I am informed by reliable cattlemen that this governmental assistance has had a marked effect in the cattle improvement of Switzerland, and that it is confidently expected that within the next half century the Swiss breeds would not only be a pure line of blooded stock, rich in the product of milk and the products thereof, but excellent in meat, and a perfect show animal, beautiful in form and color. About three years ago the federal authorities ordered experts to make an examination into all pedigreed cattle in Switzerland, giving names, ages, degrees, &c; which was done, and the report condensed into a herd-book, where all the pedigrees of pure-blooded cattle in this country may be found.

Switzerland contains but two distinct original breeds, as follows: (1) The Spotted or Fleckvieh race; (2) the Brown Schwytzer or Braunvie race. There are, however, several offshoots from the two principal breeds, which will be considered further on in this report.

THE SPOTTED BREED.

The Swiss Spotted breed belong to the heaviest of the European races. In evidence of this fact a case is cited where a Simmenthal cow of this breed, which was premiated at a cattle show held at Lucerne in 1881, weighed 1,134 kilograms.

Out of other cattle premiated at the same fair the following measurements, showing proportions, &c., are given in centimeters (1 inch = 2.5400 centimeters), to give some idea of the size of these animals:

Description.	Height, top of withers.	Circumference behind shoulders.	Length from horn to root of tail.
Bulls (average of 28 head).....	137	202	208
Cows (average of 27 head).....	140	205	213
Heifers (average of 21 head).....	135	196	205

The "Freiburg" cattle represent the heaviest and coarsest animal of this breed; is usually white, with large black spots; big boned; rather heavy head; long body; large loose barrel, and traditionally known

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(a) The Bern animal than the narrow buttock sides.

(b) The Jurr and size, but v the Alps.

H. Ex. 5

as a sort of gluttonous, fat-making machine, more particularly suitable to produce gross meat for the markets at great expenditure for artificial food.

The above measurements represent the Simmenthaler Spotted cattle. They are a trifle smaller than the Freiburg cattle and are better formed, with deep shoulders, powerful forearm; long, straight back; long from shoulder-blade to hip-bone, long from point of hip to root of tail; wide, square buttock, with round, close barrel; they are usually of white color, with pale red or yellowish spots; white face; nose milk color, with wide, open nostrils. They are highly recommended as milkers.

The size of these animals varies very much with physical features, the fertility of the country, and the more or less advanced state of its agriculture. In the high Alp districts, where the farms are small and the food poor in quality and not very plenty in quantity, the cows are smaller and do not sell for more than \$50 or \$60, while in the richer grass-land districts, where the artificial manuring is largely resorted to, the cattle are worth much more, and bring from \$80 to \$125, and sometimes more. Their weight is from 1,500 to 2,500 pounds, and some have been known to reach 3,000 pounds, live weight. Their fattening capacity are said to be very great, but they require good food, careful attention in their handling, and perfect cleanliness about their stalls. The Simmenthalers, or, as they are sometimes called, "piebalds," are considered the best milkers among the Spotted cattle. The better class cows are reckoned and averaged on reliable experiments to give from 11½ to 13½ quarts per day, counting three hundred milk days in the year, and the second class from 9 to 11 quarts. At this rate the better class cows would produce on an average 12 quarts per day, or 3,600 quarts in the year, which, at 3 cents per quart (a low average), would make the milk-yield of one cow reach the sum of \$108 per annum.

These cows are of a kind and gentle disposition, and it is claimed they can do a large amount of work without lessening either the quantity or quality of the milk.

I am informed that while the larger and middle sized Brown Schwytzers are perfectly healthy and feed well when grazed on the open mountains, yet they do not fatten readily; but when brought down in the lower districts or valleys and grazed and stabled, they not only fatten much faster, but take on more flesh than the animal bred in the low lands. In consequence of this fact the German breeders prefer for fattening purposes the Swiss cattle bred in the middle mountain regions. When these cattle arrive at maturity and are butchered in their own homes they seldom weigh over 1,000 pounds gross, but when taken down into the lower valleys, or over into Bavaria or Baden or Nassau, they can be made to weigh 1,600 pounds gross at the age of three years.

OFFSHOOTS OF THE SPOTTED BREED.

From the original Spotted breed there are several offshoots; among them are—

(a) The Berner oberlander breed, which is a shorter and lower built animal than those before mentioned. It has powerful shoulders, rather narrow buttocks, and is well adapted for grazing the high mountain sides.

(b) The Jurrischer, or half-piebalds cattle of the Jura, with less form and size, but very hardy, and easily satisfied with the hard, dry food of the Alps.

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(b) The Jurrischer, or half-piebalds cattle of the Jura, with less form and size, but very hardy, and easily satisfied with the hard, dry food of the Alps.

(c) The Ormonds, Illiez, and Lötschen breeds, whose homes are in the high mountain dales of the cantons of Freiburg, Vaud, and Valais, and only weigh from 400 to 700 pounds.

The Swiss breeders hope in the near future to entirely wipe out these inferior offshoots of the principal Spotted breed under the governmental system of assisting in the improvement of agriculture.

THE BROWN SCHWYTZER BREED.

The Brown Schwytzer is considered the dairy breed par excellence of Switzerland.

When pure they are more or less light or dark brown, with muzzle quite black, and ringed with cream color; horns white, with black tips, and medium size; and a very distinguishing light-gray streak running from the horns down the back to the root of the tail. They are somewhat smaller than the Spotted breed, but are of beautiful form and compactly built, as the following measurement will show:

Measure in centimeters.

	Height.	Length.	Girth.
Bull (average of 11 head).....	130	193	196
Cow (average of 11 head).....	132	195	201
Heifer (average of 11 head).....	126	182	195

In judging this breed the color plays a far more important part than in the Spotted breed. The color most desired is the very dark brown, which indicates the purer blood.

The hide, hair, and bones are much finer, and the milk organs much better developed, than in the Spotted breed. The flesh is also of a much finer fiber, and, consequently, sweeter and tenderer, than the larger breed.

It is claimed that the Brown Schwytzer not only gives more milk, but that it is richer than that of any other European breed of cattle. They are estimated to produce from $1\frac{1}{2}$ to 2 quarts more milk per day than the large Simmenthal cow. I have just returned from a visit to the stables of Mr. Kühn, of Degersheim, the largest pure-blooded breeder of the Brown Schwytzer in Switzerland, and he tells me that his herd of forty cows average from 17 to 20 quarts of milk per day. Of course this is an exceptional case, but it demonstrates fully what this breed is capable of under good treatment.

The original home of the large Brown Schwytzer was in the cantons of St. Gall, Schwytz, Zurich, Glarus, Lucerne, Unterwalden, Graubünden (lower part), and Appenzel, but they are now largely distributed all over Switzerland, and in portions of Germany, Italy, and France. Many of the best young cows of this breed are bought up by Italian farmers and drovers, through their agents in this country. They pay from 400 to 800 francs per head, and for extra fine ones as high as 1,200 francs is often paid at the central cattle markets at Chur and Schwytz.

MISCELLANEOUS SWISS BREEDS.

In addition to the large Brown Schwytzer every valley and neighborhood in East Switzerland has its own small cross-breed, generally from the Brown Schwytzer.

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5. Nostrils, wi
6. Horns, smoo
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8. Eyes, clear, f
9. Throat, clear
10. Chest, broad
11. Barrel, hoop
12. Back, straigh
13. Tail, hanging
14. Hide, mellow
15. Hide, covered
16. Fore-legs, sh
17. Hind-legs, sh

The Toggenburg breed is distinguished by its dark-brown color, long slim neck, shapely head, round, close barrel, and outstretched horn, and is reputed to give very rich milk.

The Appenzell and Einsiedelens have short thick necks, black heads, rather short bodies, and are of coarser fibered flesh.

The high Alps of East Switzerland, like the Berner Oberland, have a very small breed, which in some parts of the United States would be considered of the "scrubbiest" order. They have short stubby legs, small round barrels, thick coarse hair, and easily stand the cold bleak winds and deep snows of the high Alps. They climb like goats, and "grub" for subsistence on the mountain sides and peaks where the heavier cattle could not go. These ugly little animals are also reckoned as crosses to the Brown Schwytzer, but some writers place their origin as distinct and anterior to all other breeds in Switzerland. They are known as the Bündner, Léviner, and Hérens breed. They give very rich milk and weigh from 400 to 500 pounds.

There has of late years been introduced in the Engadine Mountains a new and still smaller breed to take the place of goats; their weight is from 250 to 300 pounds.

CANTONAL PRIZE SHOWS.

The custom of all cantonal governments is to offer yearly and half-yearly premiums for the improvement of the cattle breed of this country, and I only desire now to speak with special reference to my own consular district.

The canton of St. Gallé makes a yearly appropriation of 20,000 francs for the purpose of awarding premiums to the breeders of pure-blooded cattle. The sum is classified as follows:

	Francs.
Bulls	14,000
Milch cows	5,000
Miscellaneous (handling cattle)	1,000
	20,000

As a rule, the *large* Brown Schwytzer carries off the prize. The Toggenburg breed, however, is a good show-animal, and it often becomes a victorious competitor. The canton is divided into ten show-districts. The judges take into consideration and decide on the following points:

SCALE OF POINTS FOR BULLS.

	Points.
1. Head, fine and tapering	
2. Forehead, broad	
3. Cheek, small	
4. Muzzle, fine black, and ringed by light-gray color	
5. Nostrils, wide, high, and open	
6. Horns, smooth, clean, and not too thick, with tapering black tips	
7. Ears, light-gray, rather large and thick, with orange-color within	
8. Eyes, clear, full, and lively	
9. Throat, clean, neck powerful but not too heavy	
10. Chest, broad and deep	
11. Barrel, hooped, broad and deep, but little space between last rib and hip	
12. Back, straight from withers to top of hip, thence straight to setting of tail	
13. Tail, hanging down to hocks	
14. Hide, mellow and movable, but not too loose	
15. Hide, covered with fine, soft, dark-brown hair	
16. Fore-legs, short and straight, powerful fore-arms	
17. Hind-legs, short, straight, and not to cross in walking	

* The consul failed to supply the points in detail.

18. Hind-quarters, from hock to the point of rump, long and well-filled.....	Points.....
19. Hoofs, hard, black, and not too small.....	
20. Growth, general appearance, and condition	
Perfection.....	100

SCALE OF POINTS FOR COWS.

Same as bulls, except—

2. Fore-head, narrow, with rather long face	
6. Horns, small, turned-up, with tapering black tips.....	
9. Eyes, full and placid	
10. Neck, straight, fine, and placed lightly on shoulders.....	
16. Fore-arm, swelling and full above knee	
21. Udder, large in form and standing well out behind, but full in line with belly	
22. Teats, large and squarely placed, behind wide apart.....	
23. Milk-veins, very prominent	
24. Hide, deep yellow-orange color	
Perfection	114

In the heifers the scale of points are the same as cows, and they are considered perfect at 111 points before they have dropped a calf.

The greatest importance is attached by the judges to the beautiful form and purity of blood in bulls for breeding purposes, and as most of the peasants and small farmers are unable to keep one of the pure-bloods on account of the dearness of the animal, one is generally owned and kept at the cost of the various districts or townships; and by this means the cows belonging to the peasants and small farmers are served, and the pure-bloods are continually on the increase. Cattle shows or fairs are considered as a sort of public holiday by the peasants, and they are attended in large numbers. The exhibition is sometimes free and sometimes not. The premium animals are usually decorated with wreaths and garlands, and receive the dye or stamp of the fair by having the same burned into the horn. I have seen prized cattle with their horns almost branded full from the impressions made by the different society brands.

Brown Schwytzer bulls generally serve cows at the age of sixteen to eighteen months, but some of the best breeders and cattlemen say this is too early, and that they should not be allowed to serve before two years old, as they are then fully developed and give more strength and better constitutions to their offspring.

OLD AND NEW SYSTEMS OF STABLING CATTLE.

The old Swiss system of feeding and caring for cattle is fast giving way to new developments which are being made in the improvement of the various breeds, and experience is teaching the people that it is as necessary to the good health of cattle and other animals that they have plenty of light, air, and commodious quarters as it is to human beings; and the consequence is that whenever a new stable is built or an old one is remodeled, great care is taken that the stalls shall be so constructed as to give the animals more room, better ventilation, good light, and opportunity for cleanliness. During my visit to many dairy farms and peasant stables in quest of information for this report, I have been absolutely astounded to see the sort of places cattle are kept in

in some parts fifteen cows were kept in a stable, feet wide, and the width of the stall was in diameter, the stench was so bad that the "old way" of many that the room. The cows for the peasants were stable, and so down, certainly experienced breeders assists in the cattle, and com

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Caring through November until kept in the stable been made on mown two, three and the manure ditches when not times three times are fed three times of corn-meal twice a day by the tank of an fat food, and are of the high Alps ing qualities, comatic herbs, said

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* This grass grows to cut and take care the peasants go up the mountain side with day's work, however bodies, and scenery. When the hay is cut ground and continue peasants tie large bundles shoulders begin their and using it as a sort end. It often happens peasants at a time, a

in some parts of the canton of St. Gallé. I visited one stable where fifteen cows were kept. The stable proper was about 25 feet long by 15 feet wide, and not to exceed 6 feet high in ceiling; there was no window in the wall, except a hole, low down to the floor, about 16 inches in diameter, by which the stalls were emptied of the manure. The stench was simply unbearable, and yet I was told that this was the "old way" of stabling cattle in Switzerland, and it was thought by many that the cows produced more milk than if they had more air and room. The cows stood eight on each side, with scarcely room enough for the peasant to push himself through behind the cows to clean the stable, and so close together that it seemed impossible for them to lie down, certainly not with comfort. Advanced dairymen and experienced breeders take the common sense view that, while heat greatly assists in the milk secretion, yet impure heat and air cause disease in cattle, and consequently cause the milk to sour and taint more easily.

HANDLING AND CARE OF CATTLE IN THE ST. GALLÉ DISTRICT.

In the cantons of St. Gallé, Appenzell, Graubünden, &c, the cattle are handled through the year as follows:

Caring through the winter.—Through the winter, from the middle of November until the end of March or April, the cattle are continually kept in the stables, and are fed almost entirely on dry hay, which has been made on the meadows which lie in the valleys, and which are mown two, three, and four times a year, owing to the quality of the soil and the manner of manuring. These meadows are drained by open ditches when necessary, and are well manured twice a year, and some are fed three times a year, with stable and artificial dung. The cattle are fed three times a day. Milch cows are sometimes fed a small portion of corn-meal or turnips in addition to the hay. They are watered twice a day by being led out in the open air to a running stream, or to the tank of an artesian well. The young cattle do not receive much fat food, and are often fed the whole winter through on the wild grass* of the high Alps, which, however, is said to contain highly strengthening qualities, consisting of large quantities of very nutritious and aromatic herbs, said also to be very good for milch cows.

The conditions under which agriculture is followed here are so peculiar that it would be hard to compare Switzerland with either England or America.

The higher the altitude the more herbs and the more the grass is filled with spices; in fact, one might say the middle and higher alpine pastures of my consular district consist almost entirely of herbs, as they are situated from 1,700 to 3,000 feet above the level of the sea. Only in the lowlands and valleys are the cultivated grasses grown, and even about the towns and villages in this part of Switzerland the

* This grass grows on the highest (vegetation altitude) Alps, and is very difficult to cut and take care of. The mode of harvesting is as follows: In the haying season the peasants go up on the mountains, and begin mowing on the almost precipitous mountain side with sickles or short scythes. The peasants, before beginning their day's work, however, make themselves fast by means of ropes tied about their bodies, and securely fastened to a stake driven in the ground or tied to the rocks. When the hay is cut and ready for transport, a long rope is made fast on the mown ground and continued down the side of the mountain until the valley is reached. The peasants tie large bundles of hay together, and placing them on their backs and using it as a sort of banister or "hold-back" until the perilous journey is at an end. It often happens that the rope breaks or gives way under the pressure of several peasants at a time, and the result is breakage of limb or loss of life.

grasses are about 25 per cent. herbs, and in consequence of which the hay will always bring one-fourth more in the markets than if grown in the lowlands.

To continue with the stable treatment, it is correct to state that the cattle are thoroughly curried and rubbed once and often twice a day, the trouble and time being fully repaid by the loosening of the hide on the calves and those intended for fattening, as they grow much faster and accumulate flesh more readily. In well-kept stables great care is taken that the stalls are kept dry and clean, the custom being to rebed the cows each day, with an armful of either fresh straw or hay litter, which also adds largely to the stable-dung supply. The stables are usually cleaned twice a day. The manure is either packed up in small ricks some distance from the barn or shoveled into sinks, made especially for the purpose, just outside the stalls, and is either put through a distilled course or doctored with water into a liquid state and drawn off through pipes, or dipped with a long-handled bucket into a very long tank on wheels (somewhat resembling a street-sprinkler) and driven to the fields with either cows or oxen and thoroughly distributed over the ground, the cost and labor of which is more than doubly repaid by the soil producing two or three times the quantity, and a much better quality, of hay than the ordinary dry-manuring or old turf-soil.

CATTLE GRAZING ON THE ALPS.

On the low Alps.—With the spring begins different treatment; the cows and fine breeding animals generally receive half dry and half green food. As soon as the grass has grown a little, may be in April or at the beginning of May, cattle are grazed on the lower meadows, usually tethered or herded by old men, small boys, or girls. This grazing period only lasts ten days or a fortnight, as the grass must not receive too great a check, as the result would be a small hay crop on which the herd must depend for its winter food. From this low meadow grass a move is made on to the first mountain step, which is called the "Maisüss," or May seats. Sometimes we have the "Aprilsüss," but not often.

On the high Alps.—The "Maisüss" runs from the middle or end of May until the middle or latter part of June, when another move takes place, as it will not do to imperil the hay crop which is also expected from these lands. By the end of June the cattle are up to the high Alps, "Hochalpe," where they remain until October.

In this part of Switzerland the Alps consist of three stations or table-lands, the highest of which can only be grazed about three weeks in the middle of summer. At this station open sheds are sometimes put up to protect the cattle from sudden snow-storms or cold rains, which often occur. On the second station a more substantial structure is built and is not only used as stables but as a milk and dairy station. The alp is usually owned by a *commune*, and young cattle and milch cows are taken on pasturage at so much for the season (about \$6 or \$7), in which case the cows or heifers are sent directly to the "Hochalpe" in May or June, where they remain until the end of October, when the grass begins to get short and the weather cold, and they are brought directly to the valleys.

It has been thought proper to minutely describe this system of grazing in order to explain the large flow and the excellent quality of milk obtained in the Alps. The results are, cows fed on dry hay in winter, calves timed to come, if possible, in February or March; green feed

in early spring of this are on the nutritious change to the where the milk. Its delightful in the world, when well made.

It should be generally followed. Cows are kept in the valleys in the is sold.

The high Alps by the peasant neighborhood which the alps to the "Alps" and given a little which they are then taken out when they are directly afterwards during the hot stabled, especially

The "Senn" a long low and hewn pine log side, and the old long beech-wood of 12 feet in diameter about 3 feet in several long poles of heavy stones being blown off plenty of fresh in the care of the Alps the milk least taint. The butter and cheese and cheese deposited the milking is of butter, and cheese herd. The service dairy properly, "senn" and "product of each of the cow separately made out showing her stay at the "ing. It is said to 50 per cent. So cantonal and improvement of al

in early spring starts the milk secretion; later on, when the good effects of this are on the wane, the milk production gets a fresh stimulus from the nutritious grasses on the "Maisäss." Further on there is another change to the fine short grass and aromatic herbs of the "Hochalpe," where the milk is richest in flavor and contains the most milk-sugar. Its delightful sweetness and flavor is unattainable by any other feeding in the world, and this is imparted to the butter and cheese, which, when well made, are in the highest state of perfection.

It should be understood, however, that high alpine grazing is not generally followed by the larger farmers or dairymen where several cows are kept, for in such cases the herd is stabled and grazed in the valleys in the neighborhood of the towns and villages where the milk is sold.

The high Alps are grazed by herds of young cattle and cows owned by the peasants, which are picked up by ones and twos all over the neighborhood of the alp. The herd, when made up to the number which the alp is by law registered to graze for the season, is driven up to the "Alphütte," "Sennhütte," or chalét, where the cows are milked and given a little salt and bran boiled in whey with a little hay, after which they are allowed to rest a few hours in the stables. They are then taken out to the pastures, where they remain until the evening, when they are driven to the "hütte" to be milked and sent out again directly afterwards. On very hot days they are kept in the stables during the hottest part of the day, also in cold rainy weather they are stabled, especially if there is no woods on the alp.

DAIRYING ON THE HIGH ALPS.

The "Sennhütte" is usually intended for summer occupancy. It is a long low and rudely constructed shed, mainly built out of roughly hewn pine logs with one end mortised into the rocks of the mountain side, and the others laid across each other, and fastened together with long beech-wood nails. The solid roof covering consists of heavy beams of 1½ feet in diameter, with boards 1 inch thick, 12 inches wide, and about 3 feet long laid on top. These are fastened down by having several long poles stretched across them and weighted down with a lot of heavy stones weighing from 50 to 100 pounds to keep the roof from being blown off. The site selected for the stables must have near it plenty of fresh running water, necessary for the cattle and important in the care of the milk and butter. At one of these stations on the high Alps the milk and butter retain the whiteness for weeks without the least taint. The "Sennhütte" is residence, cow-shed, milk-house, and butter and cheese manufactory all together. The milk-house, butter and cheese department is generally in one room. The cow-sheds, where the milking is done, adjoins and is connected by a door with the milk, butter, and cheese room, and the room occupied by the tenders of the herd. The services of two people are generally required to attend to the dairy properly, and are usually a man and woman; they are called the "sem" and "semmerin." The cows are milked twice a day, and the product of each milking is weighed and placed to the credit of the owner of the cow separately, and at the end of the season a balance-sheet is made out showing exactly what has been the product of the cow during her stay at the "hütte." Apiculture in Switzerland is of very old standing. It is said that some alps have declined within the last half century 50 per cent. Some have increased slightly of late years on account of cantonal and central government premiums being offered for the improvement of apiculture.

CATTLE AND DAIRY FARMING.

PURITY OF ST. GALLE MILK.

The milk product of my consular district is important. Much of it is consumed, both in its natural state and its various forms of manufacture; but Swiss statistics are so very meager that it is difficult to arrive at any approximate amount of either the product or consumption. As a rule farmers and dairymen prefer to sell the milk in its natural state on the grounds; it seems to them that there is more money in it than by converting it into cheese and butter. The custom, therefore, is for those in the neighborhood of towns and cities to deliver the milk directly to the consumer at so much per quart, say $3\frac{1}{2}$ cents.

Chemical analysis of milk at St. Galle.

[From the cantonal chemical laboratory.]

Dry substance	Per cent.
Fat	12.5
Casein and albumen	3.4
Milk-sugar	4.0
Milk-salt	4.35
	.75

The local laws protect the purity of the milk, and a dairyman or milkman detected in falsifying milk or selling skim-milk for unskimmed-milk is liable to both fine and imprisonment.

MILK-CURE ESTABLISHMENTS.

There is a dairy in the suburbs of St. Galle where the cows are fed on nothing but dry food the year round. The milk is recommended for infants and aged people, is delivered by the dairyman from wagons at 7 cents per quart, and is claimed to be of considerable sanitary importance. There are also several "molkenkuranstalten"—milk-cure-establishments—in the neighborhood of St. Galle, which have existed for many years, and where people are treated for various diseases entirely with milk.

EXPORTS OF SWISS CONDENSED MILK.

From the most reliable source I can find, it appears the amount of condensed milk exported from Switzerland during the last eight years was as follows:

	Kilograms.
1875	4,261,750
1876	5,610,100
1877	5,490,100
1878	6,419,700
1879	7,813,800
1880	9,229,300
1881	11,591,400
1882	11,621,500

CONDENSED-MILK MANUFACTURE IN SWITZERLAND.

There are three milk-condensing factories within my consular district, one at Gossau, one at Romanshorn, and one at Utweil.

Each of these factories condense milk according to its own method, but none of them use sugar. The condensing apparatus used is similar to that used by condensing factories in the United States. The milk is condensed down to one-third of its original volume.

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Milk-sugar.....
Albumen.....
Ash salts.....

This milk is the beginning of Condensing Mi which increases

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CONDENSED

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The greatest possible care is taken to use none but good, clear, pure milk, produced from healthy cows if possible, pastured on high or undulating well-drained ground, with plenty of clear, sweet, running water, and every quart of milk is tested before it is put into the boiler.

These factories rent the milk products of a certain number of cows the year through, and require the milk to be delivered at the factory twice a day, where it is paid for by weight at from $2\frac{1}{2}$ to 3 cents a quart, the highest price being paid in the winter season.

The most scrupulous cleanliness is observed in every detail. In the first place the peasant, in milking his cow, is requested to take particular pains in having the cow's udder and teats clean, and to see that no filth drops into the milk, and the milking utensils are perfectly cleansed after each milking.

When the milk is brought to the factory it is strained through a double hair-sieve from the scales into a large tin or zinc tank, from whence every detail of manipulation is guarded by cleanliness; for it is an established fact that not only the cows should be fed on good, sound, healthy food, with kind, gentle treatment, but that unless the building is well ventilated, plenty of pure running water, and an entire absence of all taints and ferments, the process of condensing milk which will keep will prove a sure failure.

The Swiss Milk Company of Gossau has the reputation of being one of the best (without sugar) condensing factories in Europe, as their milk has been tested in hospitals, in armies on the march, on the sea for weeks at a time, and in the hot climes of India, and has proved itself in every instance perfectly condensed, pure milk. The milk is packed and sold in pint and quart bottles, with the American patent wire corkings. Zinc and tin cans, holding from 3 to 15 gallons, are also being used now; the advantage, it is claimed, is in the saving of the cost of bottle, the cost of packing, and weight.

The following analysis of the pure milk was made by Dr. Hehner, of London:

	Per cent.
Fat.....	8.35
Milk-sugar.....	11.46
Albumen.....	12.85
Ash salts.....	1.82

This milk is sold by wholesale at 2 francs per quart, and is considered the beginning of a most formidable rival to the famous Angelo Swiss Condensing Milk Company at Cham, where sugar is largely used and which increases the cost and makes the milk no better.

This Gossau company has only been established a little over one year, and the shares are at a premium of 20 to 30 per cent., which goes to show that there must be fair returns for the money invested in it.

CONDENSED-MILK FACTORIES IN THE UNITED STATES.

The condensed milk is so easily portable, the natural facilities are so great, the necessity in the near future for an outlet to our dairy products so important, that it seems to me the country *par excellence* for the manufacture of condensed milk should be the United States. Everything is in our favor—country, location, climate, natural facilities, cheap grass, cheap cows, inventive genius, native application, and all the qualifications necessary to a formidable competitor. If our factories will make as good condensed unsweetened milk as is made in Switzerland it is almost absolutely certain that we can supply Great Britain, her

colonies, and the South American States with this, for the future, important staple.

BUTTER-MAKING IN SWITZERLAND.

The Brown Schwytzer cow is peculiarly adapted to butter-making, because of the cream-globules being unusually large in the milk, which rise more easily to the surface, and the cream is churned more easily and quicker into butter.

It is known that the fatty substance—butter—is not in solution in the milk, but exists in the tiny drops, or globules. One pound of milk containing 40 per cent. of butter should hold about 40,000,000 globules. Every one knows that when milk is left to stand for a length of time the cream rises to the surface and is easily separated, leaving the "skim-milk" beneath. The largest of these little globules is estimated (in cream) to weigh about .0000006 grammes. These globules of fat being lighter than milk, naturally seek the position which their special gravity entitles. The larger globules rise the quickest and first, the medium ones next, and so on. The average gravity of milk is about 1.030. The difference between this and .985 brings the cream to the surface under a slow process; the very small globules never come to the surface. In different breeds of cattle, with different kinds of food and treatment, the quantity and size of the globules vary very much. In visiting the Centrifugal Butter Factory at Wyl, in my consular district, I saw milk being tested in a glass tube about 15 inches long and 4 inches in diameter; after twenty-four hours' standing the cream appeared to have risen perfectly, leaving a clear and blue line of "skim-milk," but on an examination of the "skim-milk" there were found globules still in it, of the size upwards of $\frac{1}{2000}$ of an inch in diameter, showing a wonderful richness of the milk of the Brown Schwytzer cow.

As a rule, the Swiss dairymen hold to the old system of setting milk shallow as the best and quickest mode of getting the cream. The vessel generally used is made of wood, and is from 16 to 20 inches in circumference at the top and 8 to 10 inches at the bottom, with sloping sides.

Some advanced dairymen, however, disagree with this, especially as regards wood, and are using the ordinary American milk-pan, claiming that they can be kept cleaner and are not so easily impregnated with taints, &c.

The milk under ordinary circumstances stands from twenty-four to forty-eight hours, when it is "skimmed" and turned into the churn. Sometimes the Holstein barrel is used, and sometimes the old upright piston churn with perforated holes at the end of the piston; but the churn generally used throughout the country is the revolving barrel, with stationary dashers on the inside, very wide or large circumference, and revolves on its axis like a grindstone.

The churn is filled about half full of cream, at a temperature, more frequently guessed at than tested, of near 56° to 58° F., and churned at from 30 to 40 revolutions per minute, according to the season. The butter comes in twenty or thirty minutes. The churner should be careful to listen to the slightest alteration in the sound, and when detected, the churning should at once cease, and if, upon examination, small particles of butter, no larger than a pin's head, are found, the churning is properly finished. The buttermilk should be drawn off through a hair sieve. After the buttermilk has been drawn off the particles caught in the sieve should be emptied back and the churn filled about half full of

pure water, which buttermilk should be four times as much as was put in. The buttermilk working is necessary.

The butter is sold each, and is sold to the consumer at about 100 cts.

Most of the Swiss butter is mixed with it.

The following butter (including land during the

1878
1879
1880
1881
1882

The Swiss butter has a nutty flavor, and is equal to the superior

CENTRIFUGAL

The new system of being introduced into Germany, and was first used in Hamburg, in 1878.

The complete system of the cows' milk is made by the Company of Wyl, which makes butter by centrifugal force, drawing the butter from the milk and churning it at St. Gall, and

Cheese-making in this century has been the world's market, considerable attention has been paid to the peasants for the purpose of this product, and Ireland dates as a cheese-making country.

The best-known cheese is the Emmenthaler, from the Valmaggia, Te

pure water, when after a few revolutions of the churn the water and buttermilk should again be drawn off, and this process continued three or four times until the water comes out of the churn as clear as when it was put in. This process of washing and cleansing not only takes out the buttermilk entirely, but consolidates the butter, so that very little working is necessary to make it pack properly.

The butter is made up into small rolls of one pound and one-half pound each, and is sold to dealers at from 30 to 35 cents per pound, and to the consumer at about 45 cents per pound.

Most of the Swiss butter is made from sweet cream, and salt is never mixed with it unless specially so ordered.

SWISS IMPORTS AND EXPORTS OF BUTTER.

The following table will give an idea of the approximate amount of butter (including other fats) imported into and exported from Switzerland during the five years of 1878 to 1882, inclusive:

Years.	Imports.	Exports.
	<i>Kilograms.</i>	<i>Kilograms.</i>
1878.....	5,311,700	445,700
1879.....	5,821,700	411,700
1880.....	5,952,600	580,100
1881.....	5,180,200	836,400
1882.....	4,223,200	672,000

The Swiss butter when properly made is of a deep yellow color, fine nutty flavor, and delicate sweet taste. The home demand is about equal to the supply, and if any difference, hardly sufficient.

CENTRIFUGAL BUTTER-MAKING IN SWITZERLAND.

The new system of making butter by means of centrifugal force is being introduced at Wyl, in my consular district. The discovery is German, and was first introduced at the International Dairy Show at Hamburg, in 1877.

The complete separation of the cream from the milk as taken fresh from the cows occupies about 35 minutes. The Centrifugal Butter Company of Wyl claim that they can not only make better and cleaner butter by centrifugal force, but that they can make 15 per cent. more butter from the same amount of milk than the old mode of setting the milk and churning in the usual way. This butter is sold in the market at St. Gall, and gives general satisfaction.

CHEESE-MAKING IN SWITZERLAND.

Cheese-making in Switzerland is a very old industry, but only during this century has it developed so as to take a position of importance in the world's markets. On the high mountains, during the summer seasons, considerable attention has been paid to the manufacture of cheese by the peasants for many years, but not until about 1830 were associations formed for this purpose. From that period, then, one might say, Switzerland dates as a cheese-making country.

The best-known kinds of cheese made in this country are as follows: Emmenthaler, Grayère, Spalen, Saanen, Fromaggio della paglia (in the Valmagia Tessino), Urseren, Bellelay, Vacherin, Schabzieger, Bat-

telmatt. The most important of these cheeses is considered the Emmenthaler, which is generally made of whole milk (Fettkäse), that is, milk which has not been skimmed. These are of the largest-sized cheese made in Switzerland, and weigh from 75 to 125 pounds; the diameter is from 3 to 4 feet. In some of the very large factories cheese is made in the morning and in the evening from fresh milk. The usual custom, however, is to make but once a day, in the morning, and for this purpose the evening's milk which has been set is skimmed in the morning and poured into the large kettles. To this cream is sometimes added the fresh morning milk, and the whole heated up to about 107° to 112° F., during which time it is well stirred until no more flakes of cream can be seen on the surface. At the highest temperature the evening skim-milk should be added and the heating stopped at a temperature of 86° to 98°.

The rennet used is sometimes milk-vinegar, and sometimes pieces of calves' stomachs, steeped for twenty-four hours in whey, which is thoroughly mixed with the milk. In thirty-five or forty minutes the milk gets thick and is coagulated, when it is cut up into squares with a wooden knife, after which a shallow wooden bowl with a handle is used to break the curd evenly into pieces about the size of small apples. At this stage a curd-breaker is used to break the curd into small pieces about the size of peas, when the breaking is stopped and the curd allowed to settle for ten or fifteen minutes, after which a fire is again started under the kettles and the whole stirred until a temperature of about 140° is reached, when the kettle is taken from the fire and the stirring continued until the curd is ripe. The mode of testing differs among the cheese-makers. Some squeeze between their fingers and others bite the curd. Curd to be properly "ripened" should be stirred from an hour to an hour and a quarter, and a minute or two before the stirring ceases it should be stirred so rapidly that a sort of funnel to the bottom of the kettle is formed, which makes the curd settle more compactly and be more easily taken out with a cloth. The cake is formed by the curd being placed in a cloth, incased with a hoop the width it is desired that the cheese to have depth.

Sometimes regular cheese presses somewhat like the American press is used, and sometimes a weight or derrick press; about 17 or 18 pounds of pressure to 1 pound of cheese for twenty-four hours is employed, when the cheese is taken out and put in the cemented cellar to cure. During the process of curing the cheese is rubbed daily with salt for two or three weeks, when the cheese is taken from the cellar to the cheese room above ground, where the salt rubbing is resumed every other day for a few months, when the salting is less frequent. For large cheese often a year and sometimes a longer period is required before it is ripe or may be used. From 4½ to 5½ per cent. of salt is required.

Good Emmenthaler cheese, when ripe, should be a compact mass without cracks, but when tested on the inside should contain round small holes about the size of peas, which must contain a little liquid. These holes should be evenly distributed all through the cheese. The cheese ought to melt on the tongue without leaving any small crumbs and have an agreeable, sweet taste.

Magerkäse, or skim-milk cheese, is generally made in the winter when little milk is at disposal, and the process is similar to the Emmenthaler, except the milk is skimmed and more rapidly cooked without the butter substance, which makes it harder and tougher.

Gruyère cheese is also made very like the Emmenthaler except the rennet is added at a lower temperature, say 86° F.

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Battelmatt cheese is made entirely for home consumption, as it will not bear tra sport. It is made from fresh milk directly coagulated with rennet and boiled for forty-five or fifty minutes, stirred for one-quarter of an hour and then hung up in a cloth for the whey to drip off, when it is put into wooden bowls and salted daily until consumed.

Vacherin cheese is a kind of cream cheese, and is only made in the winter, but as a smeary cheese is considerably used and is very palatable.

Saanen is a skim-milk cheese and is so hard that it is easily grated; it is used much in soups throughout Switzerland; it is made in cakes of 15 to 25 pounds.

Urseren cheese is made mostly in the canton Uri; the cakes weigh from 50 to 60 pounds. It is also made of skim-milk.

Schabzieger, or *Krauter cheese*.—This is a very important manufacture in this and the southern parts of Switzerland; the number of pounds made yearly is said to be several millions.

The process of making is as follows:

The milk is thoroughly skimmed after sitting as long as possible, when it is poured into a kettle and heated up to a boiling point, and about 20 per cent. of cold fresh buttermilk is added; after which the heating is continued, but not at such high pressure as before, and sour whey is added and the kettle is taken from the fire.

After it has coagulated, the curd is put in large, strong hemp sacks or boxes, the bottom of which is perforated with holes, and pressed with large stone weights or beam pressure.

The *zieger* then undergoes a kind of fermentation at about 62° F., which lasts a month and a half or two months. If the temperature is too high the *zieger* is apt to be readily decomposed, while if the temperature is too low it will get blue and tough. When the *zieger* has been put through a proper fermentation, it is put in a special mill and thoroughly ground, during which process 5 per cent. of salt and 2½ per cent. of dried *Meli-lotus caerulea*, Lam., is added. This clover gives the cheese its bluish color and peculiar taste. The next process is to stamp the curd into small wooden forms, lined with cloth, which are about 5 or 6 inches high and 3 or 4 in diameter. The cheese "cures" for about one year, but is frequently used after being kept in cool, dry rooms for six months. The small forms are emptied by scraping with a knife. When the cheese is to be eaten it is first grated to a fine powder, and either used alone on bread or mixed with butter. Skim-milk cheese is sold in the markets here at 6 cents, and the cream cheese at about 20 cents per pound. Cheese factories are supplied with milk in a similar manner to the condensed-milk companies, and pay about the same prices. From good, rich milk 8 to 11 per cent. of cream cheese can be reckoned to the weight of the milk. The whey of milk is still boiled down into sugar in this part of Switzerland.

The whey is boiled until only a brown sirup remains in the kettle, which is poured in flat wooden dishes and left to stand for twenty-four hours, when it becomes like crystallized yellowish sand. This is washed in cold water and sold for medicinal purposes.

EXPORTS OF SWISS CHEESE.

The amount of cheese exported from Switzerland during the last ten years is estimated as follows:

	Kilograms.
1854	5, 356, 150
1860	7, 339, 450

	Kilogram
1866	12,556, 3
1872	19,271,600
1877	17,799,000
1878	19,579,900
1879	21,017,400
1880	21,718,900
1881	24,039,700
1882	25,025,700

To every condensed-milk factory, butter and cheese factory, should be attached or connected pig-sties, as the waste milk is large. This waste at some factories I have visited is sold at 1 centime per quart or liter.

PERCENTAGE OF CATTLE BREEDS IN SWITZERLAND.

The total number of cattle in Switzerland is reckoned at 1,100,000 head.

Out of this number three-fifths are said to be of the Spotted breed and two-fifths of the Brown. In my consular district the Brown Schwytzer stands at about 95 per cent. and the Spotted breed at about 5 per cent.

The total number of milch cows is estimated to be about 552,427 head.

If these cows averaged 10 quarts per day, the daily yield would be 5,524,270 quarts, or 1,657,281,000 quarts in the year, counting 300 milking days.

Mr. Charles Kuhn, of Degersheim, has had the kindness to furnish me with a copy of his dairy book for the last year, which gives a very good insight as to the mode of conducting dairies here, and is herewith inclosed, marked A.

SWISS CATTLE IN THE UNITED STATES.

From the general observations made during my residence in Switzerland, I am convinced that the Brown Schwytzer is a very desirable animal to import to the United States, and would do better with proper handling there than here.

In searching for information on this point I applied to Col. G. Birgi, of Arth, in the canton of Schwytz, a very large pure-blooded breeder and exporter, and he informs me that the first shipment of the Brown Schwytzer breed to the United States was made in the month of September, 1869, from his stables. Quoting his words, he says:

I sold to Mr. Henry M. Clark, of Belmont, Mass., 7 heifers and 1 bull, first quality. Soon after their arrival in the United States they were resold to Mr. D. G. Aldrich, of Worcester, Mass., and Mr. David Hall, of Providence, R. I. To judge from the result, it appears the herd fell into the right hands, for Mr. Aldrich must be a practical man in breeding blooded animals and believes in seeing that the line is kept pure. The very excellent quality of these animals, in milk, flesh, form, color, and working qualities, were so marked that they soon became known, and the result was that a number of intelligent farmers formed themselves into a society for importing and raising these pure-blooded animals, and a herd-book was begun. I am informed that from this 8 head imported in 1869 the number had increased in 1881 to 169 head. Without going further into details about this first shipment, what other remarks I may make on this subject are based on the reports of this society, as made public (Metcalf, publisher, Worcester, Mass.), referring to the Brown Schwytzer race. This very interesting publication contains the statutes of the society, gives the pedigree, name, and line of breed, and from whence originally imported, &c. I observe that the climate, grass, feeding, &c., in the United States agree with the imported animal amazingly, and that the change of soil and handling is entirely to their good;

that they are equal among their native

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Messrs. Scott & I

1883: 10 heifers

1883, July 20: 6

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1883, August 5:

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*The cow

that they are equally as healthy, give more milk, and become larger in stature than among their native mountains.

Milk trials of these animals have been made in the United States which for quantity has never been equaled in this country. A cow known as Genevona gave in seven successive days 196 quarts, weighing 415 pounds, or averaging 28 quarts daily.

Since the first shipment in 1869 the export of the Brown Schwytzer breed to the United States has been about as follows:

1882: 9 heifers (two years old) and 1 bull (two and one-half years old) shipped to Messrs. Scott & Harris, Massachusetts.

1883: 10 heifers, same firm.

1883, July 20: 5 heifers (two years old) and 1 bull (fifteen months) shipped to William Thoch, New York.

1883, August 5: 1 three-year-old cow, 10 heifers (one and one-half years old), and 1 bull (eight months old) shipped to Messrs. Rider & Eldrege, Middle Falls.

For importation the Americans prefer the young cattle that have been raised in the mountains, as they are hardier, stand the voyage better, and become acclimated sooner than the older animal.

In considering the results of the importation of Swiss cattle to the United States, the committee of the Boston Exposition in 1875 reported as follows:

"This herd of European cattle, with their offspring, is from the farm of Mr. D. G. Aldrich, and present an important exhibition of themselves; they surpass the Devon, Jersey or Guernsey for butter and milk product."

A sample of butter from these cows was furnished by Mrs. Aldrich and compared with that of the Guernsey cows by Professor Motley, and was pronounced in every respect equal to the Guernsey butter, and this is rated as the best butter in the world. At a butter show in the city of New York, Mrs. Aldrich competed with butter made from the Brown Schwytzer, and, although competing with the Jersey and Guernsey, received the prize. That the American handling, soil, and climate have a great and good effect on the Swiss cattle there can be no doubt, for the same committee says: "Bulls and heifers weigh at the age of two years from 1,000 to 1,400 pounds."

Mr. Eldrege, the gentleman who received the last shipment from Switzerland, wrote to Colonel Burgi as follows: "As you know, it is another new breed in America, and it is pronounced by all who have seen any of them the best for meat, milk, and butter of any other known breed, and there is a large and growing demand for them."

The best route of shipment is via Antwerp. The freight from this locality via Antwerp over the sea, with good pressed hay and meal, with attention, is: Heifers, from 200 to 250 francs; cows, 350 to 400 francs.

The purchase of heifers (or bulls) a year and a half old is recommended, as they are not only cheaper to send, but stand the voyage much better.

EMORY P. BEAUCHAMP,

Consul.

UNITED STATES CONSULATE,

St. Galle, October 20, 1885.

*A milk-book of Charles Kuhn, Degersheim, from July, 1882, to June, 1883.**

[Explanations: M., morning; E., evening; $\frac{1}{2}$ liter = 1 pint; 1 liter = 1 quart.

Name of the cow.	July 15.		July 30.		Aug. 15.		Aug. 30.		Sept. 15.		Sept. 30.		Oct. 15.		Oct. 30.	
	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.
Belloe	9	9	9	9	8	8	7	7	4	3	4	2				
Bethli	11	10	12	12	10	10	9	10	8	7	8	6	5	5		
Bahali	6	6	8	7	7	7	7	8	8	9	9	8	8	8	6	5
Wolli	9	9	10	10	9	9	9	9	10	9	10	9	9	8	8	6
Purber	10	10	9	9	9	9	8	9	9	9	9	8	9	8	7	7
Hirschli															8	8
Bristhopf													14	13	10	10
Klupp													7	6	6	5

*The cows were tested on the 15th and the 30th of each month in half liters.

A milk-book of Charles Kuhn, Degersheim, &c.—Continued.

[Explanations: M., morning; E., evening; $\frac{1}{2}$ liter = 1 pint, 1 liter = 1 quart.]

Name of cow.	Nov. 13.		Nov. 30.		Dec. 13.		Dec. 30.		Jan. 13.		Jan. 30.		Feb. 13.		Feb. 30.	
	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.
Brüne							19	10	17	15	20	17	17	10	14	14
Bethli							20	17	16	14	10	10	10	14	10	14
Daihal	6	5	6	5	6	5	6	5	6	4	6	4	6	4	6	4
Woldi	7	6	7	6	8	7	8	7	8	6	7	6	7	6	7	6
Porher	7	6	7	6	7	6	7	5	6	4	7	5	5	3	4	2
Hirschli	8	7	8	7	8	7	8	7	10	9	9	7	9	7	9	7
Klötzli																
Bristhopf	10	9	12	11	12	11	12	10	12	10	12	10	12	10	12	11
Klupp	6	5	6	5	6	5	6	5	6	4	6	4	5	3	6	4

Name of cow.	Mar. 13.		Mar. 30.		Apr. 13.		Apr. 30.		May 13.		May 30.		June 13.		June 30.	
	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.
Brüne	16	14	15	13	14	12	13	11	13	11	12	10	12	10	10	7
Bethli	15	13	15	13	15	13	15	13	14	12	15	13	14	12	12	18
Daihal	6	4	6	4	7	6	6	4	6	4	6	4	6	4	5	8
Woldi	7	6	7	6	8	6	7	6	7	5	8	6	7	5	6	0
Porher											17	15	10	11	16	14
Hirschli	8	6	8	6	8	6	7	6	7	5	6	4	4	2	3	4
Klötzli	9	8	8	7	9	8	8	6	9	7	9	7	8	6	6	4
Bristhopf	12	10	12	10	12	10	12	10	12	10	11	9	10	8	10	2
Klupp	4	3	5	4	4	3	4	2	4	2	5	3	4	4	4	3
Schimmel	15	13	15	13	15	13	14	12	14	11	12	14	12	10	12	10
Jungferli													9	8	10	8

Name of cow.	Number of trial days.	Total quantity of milk during trial days.	Average quantity of milk for each milking day during the year.		Total number of milking days during the year.	Daily average of each cow's milk during the year—365 days.	Total product of each cow's milk during the current year.
			Half liters.	Liters.			
Brüne	16	451	28	11.417	290	94	3,365
Bethli	20	489	24	12.425	305	10.4	3,805
Daihal	21	284	13	5.917	305	5.9	2,180
Woldi	24	333	13	7.354	305	7.3	2,084
Porher	19	315	16	8.3	290	6.6	2,467
Hirschli	17	232	13	6.82	257	6.8	1,733
Klötzli	10	159	15	7.95	150	8.0	1,192
Bristhopf	18	389	21	10.8	273	10.8	2,048
Klupp	18	163	9	4.528	273	4.5	1,236
Schimmel	8	210	26	13.125	120	13.1	1,575
Jungferli	2	33	16	8.75	30	8.7	262

CATTLE

I have collected
circular of July
Cattle census
number of cattle

Geneva
Tessin
Valais
Vaud

From 1866 to
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CATTLE IN THE CONSULAR DISTRICT OF GENEVA.

REPORT BY CONSUL ADAMS.

I have collected the following information in reply to the cattle circular of July 18, and the memoranda added August 25.

Cattle census.—According to the Swiss cattle census taken in 1876, the number of cattle in this district was 193,404, distributed as follows:

Geneva	6,949
Tessin	44,188
Valais	65,024
Vaud	77,243

From 1866 to 1876 there was an increase for all Switzerland from a total of 998,291 head to 1,035,856 head, which is supposed to have been maintained at the same rate since, owing to the rise in values and encouragement given by the local governments.

Breeds.—The different breeds are so intermingled that it is impossible to give the percentage of each, or the percentage bred for the dairy and the butcher. Tessin alone has a distinct and uniform breed, known by its brown and even color.

MEAT-CATTLE IMPORTS.

In the four cantons named, constituting this district, cattle are only fattened for the butcher when they cease to serve for the dairy and reproduction. The supply being unequal to the consumption, there is no exportation save of choice individuals pure bred, but a large importation of cows and oxen from Baden and Austria and of beeves for the butcher from Italy. Nothing comes from the United States, whether cattle or products of the dairy.

American butter and cheese for Switzerland.—A suggestion made in one of my previous reports that American butter and cheese would find a ready sale here if put upon the market at certain prices was rather ridiculed by the Swiss press, but was certainly true, and perhaps is worth renewing, for Swiss butter is not of the best or the cheapest, and the cheese eaten by the people is bad.

American preserved meats.—Preserved American meats are already sold here in large quantities. Live cattle and fresh meat must wait for better communications with the seaboard. The tunneling of the Alps, and the new lines of through traffic north and south and east and west, are likely to make of Switzerland a great international entrepot and to change all the conditions of the market.

RESULTS OF BREEDING FROM IMPORTED CATTLE.

The cattle imported into Switzerland are never bred pure, and soon disappear as distinct breeds on crossing with the native breeds. These are of uncertain origin, and perhaps of high antiquity; at any rate must be treated as practically indigenous. No comparison can be made with their character and condition in their native countries, nor can one say what has been the effect on the breed by domestication here. Nor have I any information as to the extent and effect of their introduction into other countries. Whether they would produce in the United States

offspring superior to the production here can only be known upon trial, but their superiority is so largely due to the excellence of the Swiss grasses that it may be doubted. The result suggested might very likely be realized in the later generations, after the breed had been thoroughly acclimated. It is certainly not worth while to import any of the small mountain breeds, such as are found around the Gothard, in the cantons of Tessin, the Grisons, the Valais, and Uri, as the very peculiar conditions of soil and climate under which they thrive at home could hardly be found east of the Rocky Mountains, if there, and they would not bear so long a journey well.

CHARACTERISTICS OF SWISS CATTLE.

The original of all the Swiss breeds is perhaps the race found in the primitive cantons. Two races are generally spoken of, the Spotted and the Brown, of even color, which again are subdivided into varieties according to origin, habitat, color, &c. I have added in a table all the details available of four breeds which have been selected as the fittest for domestication in the United States. It is to be said of them all that they have reached their excellence through the abundance and richness of the food-supply, and careful breeding and management, which have been carried to great perfection in the regions where they are found—the cantons of Bern, Zug, Lucerne, Schwytz, &c.

The foregoing information is drawn principally from a report made to me by Mr. R. Schatzmann, director of the Station Laitière Suisse, at Lausanne, the author of several publications and probably the most competent authority in my district on the subject. The annexed table is entirely filled up by Mr. Schatzmann.

LYELL T. ADAMS,
Consul.

UNITED STATES CONSULATE,
Geneva, November 21, 1884.

Statistics of Swiss cattle suitable for introduction into the United States.

Name of breed.	Annual average pounds of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Cantons where found.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	
Simmenthal	5, 100	28 to 30	11 to 12	Argovie, Basle, Bern, Soleure, Zurich.
Freiburg	5, 100			Freiburg, Vaud, Neuchâtel.
Fratigen	5, 840			Bern.
Schwytz	5, 840	30 to 32	12 to 13	Primitive and Eastern Switzerland.

[Size in centimeters at maturity.]

Name of breed.	Cow.		Bull.		Ox.	
	Height.	Girth.	Height.	Girth.	Height.	Girth.
Simmenthal	160 to 162	210	160 to 165	240	180 to 190	250
Freiburg	160 to 162	210 to 216	160 to 165	240	180 to 190	250
Fratigen	140 to 150	205 to 210	165	202	170 to 180	230
Schwytz	136	200 to 210	150	200	140	230

Name of breed.

Simmenthal

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Fratigen

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Statistics of Swiss-cattle, &c.—Continued.

Name of breed.	Live weight.			Age at maturity.	Weight of meat at maturity in per cent. of living weight.
	Cow.	Bull.	Ox.		
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Years.</i>	
Simmenthal	1,000 to 2,000	2,400 to 3,000	3,000 to 3,200	4	57 to 60
Freiburg	1,000 to 2,000	2,400 to 3,000	3,400 to 3,500	4	57 to 60
Fratigen	900 to 1,200	1,200 to 1,500	1,400 to 1,600	3½	57 to 60
Schwytz	800 to 1,500	1,000 to 1,500	1,200 to 1,600	3½	57 to 60

Name of breed.	Color.	Description.
Simmenthal	{ Red or tawny (fauve)	{ Great height, strong workers, good milkers, easily fattened.
	{ White	
Freiburg	Black or white	Medium height, excellent milkers, easily fattened.
Fratigen	Tawny, white	
Schwytz	Brown, white and black	Same as preceding.

HOUSING, FEEDING, AND BREEDING IN THE GENEVA DISTRICT.

Methods of housing.—In the plains cattle are stabled the whole year. In the mountains they are pastured in summer; fed on hay and aftermath in winter.

Feeding.—Natural fodder (hay, aftermath, grass). In winter in plains artificial fodder is added, bran, flour, distillery-refuse, malt, &c.

Breeding.—Bulls are used from the age of one and a half years. Cows bear the first calf when two or three years old.

SOIL, SUBSTRATUM, AND GRASSES.

Soil.—Interminable variety. In Jura, calcareous. In the Alps, granitic. In plains, alluvial and diluvial; all varieties mingled.

Substratum.—Similar composition to preceding.

Cultivated grasses.—Natural grasses of very great variety in mountain pastures. In the plains cultivated grasses, timothy, clover, rye-grass, lucerne, esparcette, &c.

CATTLE IN MALTA.

No cattle are raised in Malta. The cattle that reach here for consumption are brought from Barbary, Tunis, and other neighboring countries. They are mainly classed as bullocks, are brought here alive, their fattening completed, and slaughtered as needed by consumers.

JOHN WORTHINGTON,
Consul.

UNITED STATES CONSULATE,
Malta, October 12, 1885.

Ox.	Birth.
Weight.	
to 150	250
to 160	250
to 180	250
140	250

ITALY.

CATTLE AND DAIRYING IN LOMBARDY.

REPORT BY CONSUL ORAIN, OF MILAN.

I have the honor to acknowledge the receipt of the circular of the Department dated July 18, 1883, which, however, did not reach this consulate until the 1st instant.

SWISS CATTLE IN LOMBARDY.

There exist in Lombardy only milch cows of Swiss breeds. They are yearly imported in large numbers from Switzerland, to supply the place of those which have become unprofitable for the dairy. In the irrigated districts grass is cut during eight months of the year, and on the winter meadows (*marcitorio*) during ten months. This fresh grass, supplemented with oil cake, meal, &c., is fed to the cattle, so as to produce the largest quantity of milk. Such a nourishment continued through so many months in stables, and in a mild climate, naturally soon exhausts the milking properties of cows, and necessitates the annual substitution of about 15 per cent. of the herd. The loss by this is more than met by the large product of milk, which averages yearly from 3,000 to 4,000 liters per head. Dairymen having 100 or more head ordinarily find it to their interest to send the calves, when a few days old, to the slaughter-house. This state of things having existed for a long time, it is evident that scarcely a trace remains of original Lombard breeds. The so-called Bergamasche and Brescian races are only a reproduction of Swiss stock.

The foregoing applies to the large stationary dairies of the Lombardian plain. In the irrigated district, bordering the river Po, there are large dairy herds, which are driven in summer to the rich pastures of the Alps, and which remain there until autumn, when they are taken back to the plain. There are also small dairymen in the mountains, who drive their cattle to the plain in winter. In these migrations are also included oxen, being raised for labor or beef; and the proprietors both of the plain and mountain districts supply themselves with dairy cows of Swiss breeds and oxen from the Tyrol. In the Alpine districts there are small races which take the name of the valleys in which they are raised, but they are a Swiss stock. Large breeds taken from the plain to high mountain districts, and there propagated, undergo in a few generations a decided change, from the effect of a different climate, soil, and diet. They become smaller, more hardy, and nimble of foot, and otherwise adapted to the requirements of their habitat. Lombard dairymen import their cows principally from the canton Schwytz, but some are brought from the cantons of Unterwalden, Zug, Appenzell, St. Gallen, and Glarus. They are preferred in the order named, and if breeds of these stocks are required they should be brought from those cantons.

The Tyrolese oxen above mentioned are first brought while young into the province of Brescia, and thence scattered over the plain under the name of Brescian oxen. They are short horned, of a grayish-white color, have the characteristics of the Podolico race. They are tall,

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heavy, white skinned, and easy to fatten. If breeders of this race are desired they should be obtained from Merano and Lana, in the Tyrol. Some oxen are brought from Emilia to the provinces of Cremona and Mantua, but those of the Tyrol are preferred.

Although there are no indigenous Lombard breeds, I would strongly recommend the breed of the canton Schwytz as well deserving the attention of American dairymen and stock-raisers, if the same has not already been tried in our country. Dairymen and stock experts here represent it as decidedly superior for the dairy to other Swiss breeds, and it is even claimed by many to be the best in Europe. The opinion of these persons should have some weight, when it is considered that the dairy industry is probably as strong in Lombardy as in any part of Europe, and that the butter and cheese product is so large that farmers find it to their interest to renovate their herds exclusively by importations from abroad. The magnitude of the industry may be better understood when I state that in the province of Milan, which contains 1,155 square miles, there are 132,928 cows, according to the last statistics. The butter known as Milan butter is largely exported and is highly prized in London, Paris, and other capitals. The several kinds of cheese known as Gorgonzola, Brintz, Gruyera, Formaggini, and Parmigiano are well-known in the great markets of the world.

The Schwytz cow is ordinarily of a dun color, weighs from 900 to 1,100 pounds, has short horns, which are black and white, and costs in the canton about \$130. She is a hearty feeder, and, if well nourished, gives milk a longer term of years than any other cow known here. A peculiarity of the Schwytz is the long, light, coffee-colored hair growing from the interior of the ear, which is a conspicuous object in contrast with the dark coat of the head and neck.

Great attention has been given to the milking breeds of other countries by the Lombards, and their comparative merits are well understood; but at an important exposition of cattle held at Lodi in September last, the committee in charge of the subject unanimously recommended dairymen to replenish their stock from Switzerland, and the Schwytz breed received the first mention.

The form of the Schwytz does not present the smooth and delicate outline of the English breeds. It is thick and ox-like. I inclose a cut of one exhibited at the Milan National Exposition of 1881, and which secured the gold medal. The best route for the transportation of Schwytz breeders to the United States would be by the St. Gothard Railway to Genoa, and thence by steamer to New York. The railway expense is about \$5 per head.

CATTLE BREEDS OF NORTHERN ITALY.

There are in other parts of Northern Italy types of cattle which are native or acclimated from time immemorial. Such is the breed of Piedmont, known as the Piedmontese or Carmagnolo race. This is a distinct type, tall of stature, short horned, grayish-red color, and with a conformation, especially the cranium, closely resembling the Garonne breed of France. It is essentially a stock for beef or farm work, and is fattened and largely exported to France, where, as beef, it is rated as inferior only to the beef of the best French stock. Cattle of this breed, or of subraces closely allied to it, are found in every part of Piedmont. Emilia, in its northern part, about Piacenza, has a specific type of oxen called Bardigiana, red or mottled with white, and long-horned.

In the plain toward Parma is the race known as Reggiana or Parmense. This has been bred with much care, by selections from the best, and is considered excellent for mixed uses, *i. e.*, for labor, fattening, and milk. In form, fineness, stature, and weight these animals are regarded as the type of the large races bred on the central plains of Europe; but the uniformity of the red coat, without marks, and the thick, short-limbed body are considered proof of the acclimation of this breed in Emilia in remote ages. Zoologists assert that it is descended from the ancient *bue Italico*. South of the Taro, and extending beyond Bologna, are cattle known as the Pugliese breed.

PORTRAITS OF ITALIAN PRIZE CATTLE.

I inclose cuts of animals exhibited at the national exposition held at Milan in 1881, as follows:

Bull Jupiter, belonging to the agricultural committee of Savigliano, of Piedmontese breed.

Bull Pertinace, owned by Mr. Manara, of Asti, of Piedmont breed.

Bull Adams II, one and a half years old, of the Chianina (Tuscany) breed for work.*

Young bull Napoli, exhibited by the agricultural committee of Lendinara, and of Pugliese breed, for farm work.

Bull Ghinassi, three and one-half years old, Pugliese breed, for work oxen.

Bull Tigro, of Freiburg-Fruilana labor breed, two years and nine months old.

Bull Maestoso, of Mantua labor breed, exhibited by the Agricultural Society of Mantua, and awarded medal.

Cow Mantova, of the Freiburg (Swiss) breed, eleven years old, from the estate of S. Rossore, belonging to King Umberto.

Heifer Anversa, Holland breed, exhibited by the Agricultural School of Brescia, and awarded gold medal.

Fausta, five years old, Pugliese breed, exhibited by the Agricultural Society of Lendinara (Rovigo).

Cows Minerva and Cole, of Brittany breed, awarded silver medal.

DUNHAM J. CRAIN,
Consul.

UNITED STATES CONSULATE,
Milan, November 30, 1883.

BUFFALO CATTLE OF TERRA DI LAVORO.

REPORT BY CONSUL HAUGHWOUT, OF NAPLES.

I have the honor to submit to the Department of State a report upon the breed of cattle within this jurisdiction, in compliance with the requests contained in the circular of the Department of State, dated July 18, 1883.

The area of country included within the limits of this consular jurisdiction furnishes a race of cattle peculiar in its characteristics. By far the largest and most important portion thereof is domiciled on the plains lying to the north and east of the province of Naples, the so-called "Terra di Lavoro," once called the "Campagna." This tract of land is a vast plain of trachytic tufa, overlying beds of clay deposits, which, in turn, rest upon a substratum of limestone. It is about 100 feet above the level of the sea, and enjoys the same degree of mildness of climate as the near province of Naples, that is to say, the mean temperature in

* Transferred to report by Consul Crosbey, of Florence, concerning this particular breed.

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YOUNG BULL "NAPOLI"

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YOUNG BULL "NAPOLI"

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BULL CHINASSI

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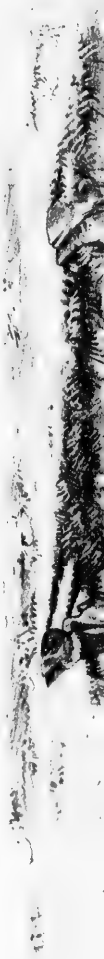


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BULL MARIOSO

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BULL MAFRISOLO

Julius Brant & Co. Lith



COW "MANTOVA," OF THE FRIBURG SWISS BREED

Julius Rosen & Co. Ltd.



COW "MANTOVA" OF THE FRIBURG SWISS BREED

Julius Benck & Co. Lith

HEIFER "ANVERSA", HOLLAND BREED



HEIFER "ANVERSA", HOLLAND BREED

Julius Benck & Co. Lith.

"FAUSTA", PUGLIESE BREED, 5 YEARS OLD

Julius Brand & Co. Ltd.



FAUST, PUGLIESE BREED, 5 YEARS OLD

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COMMON WATER BUFFALOES OF THE EAST

Illustration by J. H. H.

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summer is from 18° to 23° Réaumur, and in winter about 8° Réaumur, rarely falling to 3° Réaumur. The tufa referred to varies in thickness from 100 to 300 meters in depth, is rich in potash feldspar, and is covered with a luxuriant growth of wild grass.

Over this tract of land cattle of the buffalo race, the origin of which is unknown, roam in a semi-wild state. This race has never, to any extent, been crossed in breeding, but retains many peculiarities that render it exceedingly hard to manage. In color the cattle are black, or reddish black; are shaped somewhat like an ordinary cow, not so evenly, however, with short, round necks, large and curving horns, and with the rump somewhat larger and heavier than that of the ordinary cow.

The "Terra di Lavoro" contains about 12,000 of these cattle, bred mainly for the purpose of yielding milk for cheese-making. During the period of their milk-giving, and after they become useless for this purpose they are used before the plow or for other purposes which have in view the development of the soil. When they become unfit for such purposes they are turned over to the butcher. This occurs when they are about fourteen years old. Some are in the first instance fed for the butcher, and in such cases the meat is of the first quality, but in the majority of cases the meat of cattle whose lives are passed in the manner in which these buffaloes live is neither very tender nor very desirable.

The cheeses made from the milk of the buffalo cows are called "latticini." They are close and heavy in consistency; are sweet, and are consumed entirely within the limits of their production, being in no wise adapted for exportation.

There has been during the past ten years a slight increase in the stock of cattle referred to, an increase due in a measure to the increase in the demand for cheese and meat. In the section of the country towards Rome there has been a diminution, due to the cultivation of the soil, by reason of which the cattle have lost their natural food and have decreased in numbers, as, I am informed, multiplication depends very much upon the character of the food they receive.

As a race the buffaloes have never been closely studied. Within the memory of the present proprietors of the cattle lands no improvement has been made in the breed of the animals, and none have been exported, except a few to Sicily yearly. The question of exportation is deemed to be full of difficulties, and the proprietors do not deem it of advantage to them to attempt to send these cattle abroad. They are at times exceedingly wild, and consequently difficult to manage. In spite of this they are productive, and the result is remunerative. In some cases there have been crossings with a breed of Swiss cows from the neighborhood of Bern, Switzerland, which are best adapted to the furnishing of milk for butter-making. These cattle are found in the Piano of Salerno, and are, I learn, exported yearly in large numbers.

The buffaloes arrive at maturity when about three years of age; then the size of the buffalo bull is about 1 meter and 80 centimeters; that of the ox the same, and that of the cow about 1 meter and 60 centimeters. The weights thereof at maturity are about as follows: Bull, 2,000 pounds; ox, 2,000 pounds; cow, from 1,600 to 1,700 pounds. The yield of milk averages about 14 liters a day from each cow, when the buffalo calf does not draw upon the mother for its supply of nourishment. About 15 liters of milk make 3 kilos of cheese, containing all the butter from the milk and being very rich and exceedingly heavy. The buffaloes require little care, and in fact they get but little. They are never

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Name of breed.

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Methods of housing: No special method used. In case of severe weather the cattle have the protection of a heavy shed.

Feeding: Wild grass of Campagna. Occasionally a little hay.

Breeding: No special method used. Cows calve in autumn.

Handling products: Cheese packed in leaves and in wicker baskets and consumed at home.

CATTLE IN PIEDMONT.

REPORT BY VICE-CONSUL DEZEYK, OF TURIN.

Detailed description of such domesticated animals as have proved by long experience to have been profitable in Piedmont, Italy, with information about the topography of the country and the composition of the soil.

Name of breed.	Annual average pounds of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Size at maturity.			Live weight.		
				Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
Piemontese	5,000	15	8½	Large....	Large....	Large....	Lbs. 1,200	Lbs. 1,800	Lbs. 1,700
Mixed breeds	5,000	15	8½	...do....	...do....	...do....	1,000	1,800	1,100
Mountain breed	8,000	12	7½	Medium..	Medium..	Medium..	1,000	1,300	1,100

Piemontese.—Five years at maturity; weight of meat, 60 per cent. of live weight; color, light gray; meat, good; milk, middling; cheese, good.

Mixed breeds.—Five years at maturity; weight of meat, 60 per cent. of live weight; color, light gray; meat, milk, and cheese, good.

Mountain breed.—Five years at maturity; weight of meat, 60 per cent. of live weight; color, brown, black, and white spotted; meat, milk, and cheese, good.

Topography.

Altitude.	Temperature.		
	Mean.	Summer.	Winter.
Piedmont, 200 meters above the level of the sea	° C. 14 to 15	° C. 25 to 32	° C. 10 to 12
Mountains, 300 to 1,000 meters above the level of the sea	10 to 12	20 to 25	15 to 10

SOIL.—*Alluvial:* Piedmont. *Loam:* Collina. *Clay:* Monferrato, branch of Apennines. *Sandy, &c.:* Valley of Po.

SUBSTRATUM.—*Limestone:* The Piedmont hills in general, and those of Turin in particular. *Sandstone:* The district of Asti. *Clay:* Monferrato. *Gravel, &c.:* The valleys of Po, Tanaro, Dora, &c. *Granite:* The mountains. *Cultivated grasses:* *Timothy*, none; *clover*, abundant; *rye-grass*, &c., moderate.

Methods of housing: Stabling in winter and pasturing in summer. *Feeding:* Hay and grass alternately. *Breeding:* Domestic. *Handling products:* Meat, butter, and cheese.

The "Pianura" pure breed would thrive well in corresponding states or latitudes; purchase price averages 800 francs for bulls; 600 francs for oxen; 500 francs for cows.

The best route for exportation is per railroad to Genoa and per steamship to New York.

The stock of cattle is steadily increasing in Piedmont on account of its profitableness. The number bred by far surpasses the home de-

mand, and the surplus is exported mostly to France for butchering purposes. During the first eleven months of 1883 there were exported from Italy to France 96,000 head of cattle (between calves and beef), and a like amount of sheep (between lamb and mutton). With the exception of some corned-beef in cans, no meat or dairy product of any kind is imported into this district from the United States.

The last census of 1882 gave the following figures of the number of cattle and of their adaptability in the four districts of Piedmont, respectively:

Animals.	Adaptedness.	Number.
District of Cuneo:		
Calves (male), under one and one-half years		29,213
Calves (female), under one and one-half years		20,287
Bulls	For work	20,002
Oxen	do	83,004
Cows	For work and milk ..	120,441
District of Turin:		
Calves (male), under one and one-half years		26,144
Calves (female), under one and one-half years		38,903
Bulls	All work and meat ..	1,515
Oxen	do	22,688
Cows	do	198,783
District of Alexandria:		
Calves (male), under one and one-half years		23,230
Calves (female), under one and one-half years		12,163
Bulls	All work and meat ..	261
Oxen	do	61,157
Cows	do	50,264
District of Navarra:		
Calves (male), under one and one-half years		11,452
Calves (female), under one and one-half years		22,592
Bulls	One-third work	1,043
Oxen	do	23,745
Cows (two-thirds milk)	do	129,070
Total number of cattle in Piedmont in 1882		861,035

A. J. DEZEYK,
Vice-Consul.

UNITED STATES CONSULATE,
Turin, January 10, 1884.

CATTLE IN TUSCANY.

REPORT BY CONSUL WELSH, OF FLORENCE.

In reply to the circular issued by the Department of State, dated July 18, 1883, I have the honor to submit the following report:

The breeds of horned cattle raised in Tuscany are five in number, and named respectively Chianina, Maremmana, Tiberina, Svizzera, and Montanina.

The Chianina, Maremmana, and Tiberina are descendants of the breed called Podolico, or Pugliese, from Puglia, in the south of Italy. The Svizzera, or Swiss breed, originated at Lugano, Switzerland, and the last, or Montanina, are hardy mountainous cattle of a nondescript origin.

THE CHIANINA BREED.

The breed called the Chianina, or the Val di Chiana, is the most valued in Tuscany for all purposes, whether for producing milk, beef, or powers of traction. A report on this breed was forwarded to the Depart-

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PIEDMONT COW



From the author's collection



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PIEDMONTESE COW

Julius Brøn & Co. Ltd



PLATE I.



PIEDMONTESE COW

Julius Ben & Co. Lith

PIEDMONTESE MOUNTAIN BULL

Tullis Bros. Co. Lith.





Edwin Ross & Co. Inc.



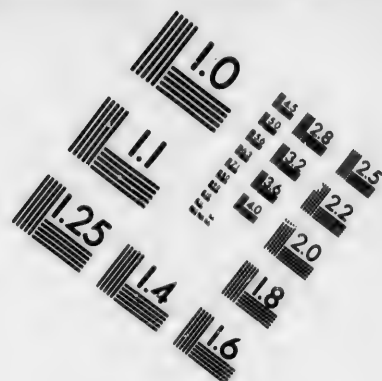
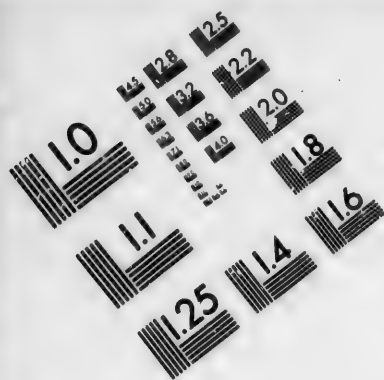
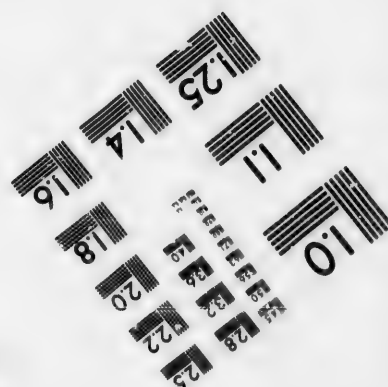
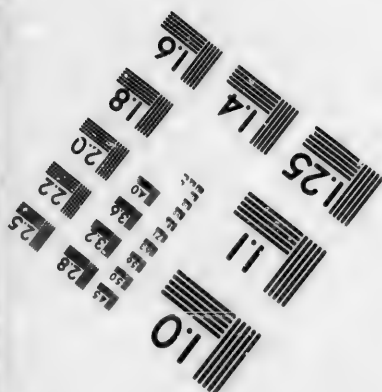
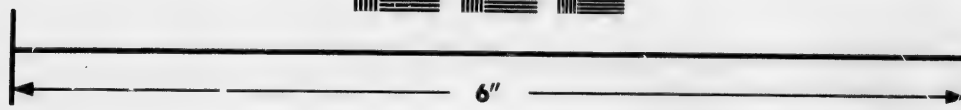
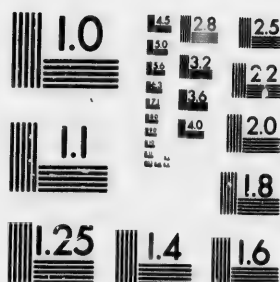
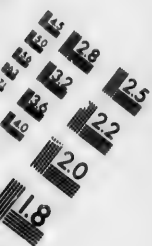


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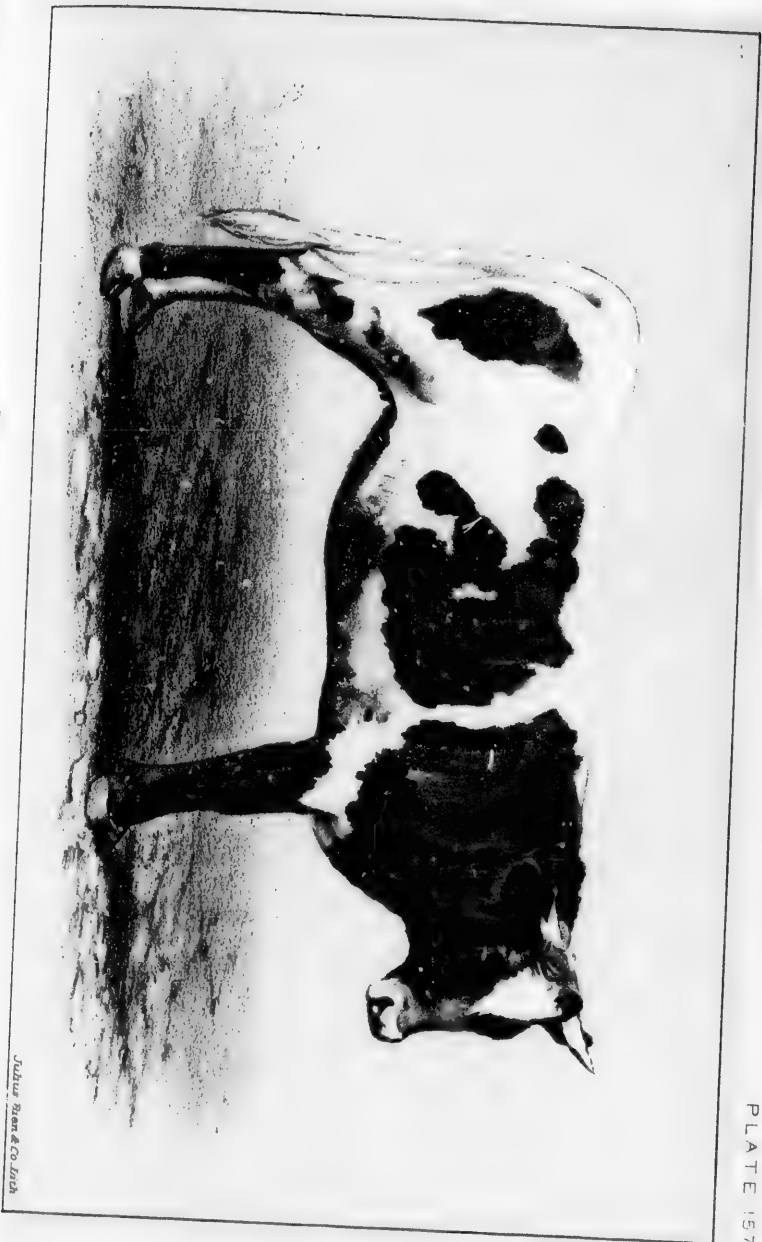
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PIEDMONTESE MOUNTAIN HEIFER

Julius Rose & Co. Inc.





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ment of State by my predecessor, Mr. J. Schuyler Crosby, on the 20th May, 1882, and as far as I can learn was in all points correct except as regards prices, which were too high.*

This, the Val di Chiana, I think the only breed in Tuscany worthy to be exported to the United States, unless perhaps a trial might be made with the Montanina, a very hardy class of cattle, and producing good milk on what they can pick up in the mountains; they are also good draft and fair beef cattle.

CATTLE OF THE VAL DI CHIANA.

The following is the substance of a letter received from the agent of Count Frassineto, who is the most important breeder and dealer in the Val di Chiana breed of cattle, and whose statements are entirely to be depended upon. The color of the Chianina cattle is white, with fine horns, and eyes peculiarly bright and expressive. They are, indeed, very handsome.

A new-born calf weighs about 44 to 55 pounds, and at one year will weigh about 1,102 pounds and measure in height about 5 feet. The estimated price is \$115 to \$135.†

A bull two years old, measuring 5 feet 6 inches and weighing 1,763 pounds, would be about the average. He might bring \$193.† A bull three years old measures 6 feet 3 inches and weighs about 2,204 pounds.

A calf after castration and arriving at the age of one year may weigh from 881 to 1,102 pounds, and measure 5 feet, being valued at \$77.20. At two years this calf would measure about 5 feet 6 inches, weigh 1,543 pounds, and be valued at from \$96 to \$116. At three years it is considered an ox, would measure about 6 feet 3 inches, weigh about 2,204 pounds, and be worth from \$135 to \$154.

Heifers at one year weigh 882 pounds, and measure 4 feet 7 inches. At two years 1,323 pounds, and measure 5 feet 3 inches. At three years a heifer becomes a cow; size about 5 feet 3 inches to 5 feet 7 inches; weight about 1,543 pounds. The prices of cows are the same as for oxen.

Of this breed, both male and female arrive at the age of puberty when twenty months to two years old. The male serves well up to four years of age, the female to ten years and over. Oxen are yoked when about twenty months and generally endure six or seven years of work.

Feeding and housing.—In this district cattle are generally kept in stalls. They are fed as follows: Winter, a mash of turnips and hay with bean or corn flour thrown in, if the cattle are to be fattened. While working they are fed with hay alone with one portion of oats per day.

Bulls are higher fed; hay, turnips, and oats being freely given. To cows besides the usual food given to oxen, rye flour and flour of peas or beans are added. These latter increase the milk secretion.

During spring, summer, and autumn grasses are freely given; care, however, is to be taken not to mix the fresh food with the dried.

In regard to feeding, 6.61 pounds of fodder are needed daily for each 220 pounds of live weight. This for cattle being fattened and stall-fed. To fatten thoroughly, 11 pounds must be fed daily for every 220 pounds. For cattle at work or serving, 8 pounds for every 220 pounds per day.

* This report is published immediately following Consul Welsh's report.

† These prices, the consul says, are much overestimated.

TRANSPORT FEED.

While being transported, whether on land or sea, oats, beans, and, if possible, turnips should be used, good hay being always provided.

The straw needed for each head is from 5.51 to 6.61 pounds daily.

COST OF FODDER.

The cost of fodder is about as follows: Beans, \$3.08 per 2.84 bushels; oats, \$1.93 per 2.84 bushels; lupines, \$1.93 per 2.84 bushels; beans, \$3.47 per 220.46 pounds.

I am assured by Count Frassineto that where turnips are plenty this breed of cattle is sure to thrive.

CHIANINA BULLS.

The description of well-made bulls should be as follows: Back straight, neck thick, head small, horn white, finely shaped, with black tips; ears quite long, but well shaped; legs large and strong, but disposed to be knock-kneed; tail short; the entire color is white, with exception of muzzle and tip of tail black; the tongue dark; the barrel or body is well rounded and long, the chest full, hoofs not too straight. In general appearance the female differs little from the bull.

MAREMMANA CATTLE.

The Maremmana breed, generally of a gray and white speckled color, are to be found on the salt marshy plains of Volterra and on the clay ground in the vicinity of Sienna. They are a strong working cattle, but would not, I think, be apt to improve any breed in the United States, being in themselves almost mongrel. The Tiberina differ but little from the Maremmana.

SVIZZERA CATTLE.

The Svizzera breed, from Lugano, Switzerland, is only found in the vicinity of Pisa. The cattle are generally black in color and produce good beef, but are only medium workers or milk producers. Their importation can hardly be recommended.

TRANSPORTATION OF ITALIAN CATTLE TO THE UNITED STATE

With regard to transportation to the United States, an actual or trustworthy estimate cannot be given unless the number of cattle is known. From Arezzo to the port of Leghorn the railroads transport ten head of cattle for about \$15.

From Leghorn to New York the Anchor Line charges about \$100 for mere transportation and the necessary water for one animal, and \$75 each for any number not under ten. In case a number of cattle are to be shipped a portion of the "tween decks" or, in summer time, the spar deck of a vessel, should be chartered, and the stalls or boxes built by the shipper.

I would always advise that the space necessary should be hired or chartered, whether on steamer or sailing vessel, and then the requisite stalls or boxes put up and furnished by the shipper, who should see that the attendants were men understanding the treatment of cattle at sea.

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Color: Silver-whi

Description: Neck

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Origin of breed: M

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PURCHASING ITALIAN CATTLE FOR EXPORT.

No considerable quantity of cattle should be purchased unless through an agent thoroughly understanding—that is, practically knowing—cattle; an agent who can judge as to value, strength of constitution, &c., and one whose sympathies have not been engaged by the seller. The prices given here are always *first* prices; the last price can only be fixed upon by bargaining, and that should be done by a practical cattle dealer.

I append forms answering as near as possible the requirements of the circular.

WM. L. WELSH,
Consul.

UNITED STATES CONSULATE,
Florence, November 6, 1884.

Statement showing the cattle exports from Italy.

[Nearly all to France.]

To foreign countries.	Bulls and oxen.	Cows.	Heifers and calves.
1882			
1881	62,639	19,396	27,997
	30,877	11,039	24,028
Increase	31,762	8,357	3,969

Special statistics concerning Tuscan cattle.

[Name of breed: Chianina.]

Animals.	Size at maturity.	Weight on the hoof.	Age at maturity.	Dead weight.
	Meters.	Pounds.		Pounds.
Cow	1.70	1,548		700
Bull	1.60	2,204	3	1,500
Ox	1.90	2,204	3	1,200

Annual average gallons of milk: 450 gallons yearly production of a cow after second delivery.

Milk to pounds of butter: 5 gallons milk to 2½ pounds of butter.

Milk to pounds of cheese: Sheep cheese alone is produced in Tuscany.

Name of country: Val di Chiana, Florence, Pisa.

Color: Silver-white mantle.

Description: Neck very thick, abundant mantle, small head, short and black muzzle, thin horns, long ears and flesh colored inside, strong and large legs, short tail, black tip.

Origin of breed: Modification of the Pudolico type or Pugliese, from Puglia (South Italy).

Labor: Enduring great amount of labor. In a farm managed by four men and two women (which is considered to be the average) oxen are put in the yoke 172 days in the year, viz: 53 winter, 13 spring, 44 summer, 62 autumn.

Feat: Making excellent beef, this kind of cattle being easily fattened.

Milk: A good cow will give about 1.50 gallons of milk a day; 5 gallons of this milk will make 2.2046 pounds butter.

Cheese: In the vicinity of Florence about three-fifths of the cattle are bred for the dairy and butcher.

Topography of Tuscany: Tuscany may be divided in four agrarian zones, viz: (1) Mountains with metals of secondary and eruptive formation, one-tenth; (2) Apennine

nines of secondary and tertiary formation, four-tenths; (3) hills of a late tertiary formation, three-tenths; (4) plains of quaternary and alluvial formation, two-tenths.

Temperature: The climate, mild in winter and temperate in summer, is, notwithstanding, subject to chilly weather in the autumn and white frost in the spring. The yearly average temperature in Tuscany is between 14° and 16° centigrade; the mercury seldom falls below 7° below zero at Florence, 5° at Arezzo and Sienna, 3° at Lucca, and 2° at Pisa. Snow seldom falls, and never lasts long. The Apennines are, however, often covered with snow, and sometimes until the spring.

Soil: Alluvial. The soil is mountainous, the ground somewhere excessively stony, and in other regions refractory to good culture, owing to the abundance of clay.

Substratum.—*Florence:* Secondary, late tertiary, and quaternary formation. *Pisa:* Late tertiary, quaternary, and alluvial formation. *Sienna:* Secondary and tertiary formation of Cretaceous period. *Volterra:* Secondary and eruptive formation.

WHITE CATTLE OF TUSCANY.*

REPORT BY CONSUL CROSBY.

I have the honor to submit the following report regarding a very fine breed of Italian cattle, with the hope that it may prove useful in inducing some of our cattle breeders to introduce them into the United States.

For many centuries the Val di Chiana (Tuscany) has been celebrated for its white cattle, large in size, docile, and easily managed, capable of enduring great amount of work, and making excellent beef, they being very easily fattened. I have visited many of the estates and poderi for the purpose of examining these cattle, and certainly agree with the proprietors and farmers in their opinion that for working purposes and beef they are far superior to the Durham and Shorthorn breeds so popular in England and America. For milk and butter I do not recommend them. Bulls begin to serve heifers and cows from the age of two years up to four or five years, when they are slaughtered. Heifers are taken to the bull when twenty months old, and are usually bred to until eight to ten years old. Oxen, and heifers as well, are put in yoke when twenty months old, and are fit for work at the age of two years, and, unless injured, stand five years more of hard work, when they are usually stall-fed and slaughtered. About the same food and fodder are used for fattening as in the United States.

The following tabular form will show interesting details as to age, weight, and price:

Kind.	Age.	Height.	Weight.		Price.	
			From—	To—	From—	To—
			Pounds.	Pounds		
Calf	Birth		45	75		
	Six months	4 feet	330	450		
Heifer	One year	5 feet	880	1,100	\$120 00	\$140 00
Bull †	One year	5 feet 2 inches ..	880	1,000	80 00	100 00
	Two years	5 feet 7 inches ..	1,550	1,750	200 00	
	Three years	6 feet 3 inches ..	1,550	2,200	250 00	
Ox	Three years	6 feet 3 inches ..	1,850	2,200	140 00	300 00
Cow §	Three years	5 feet 2 inches ..	750	1,500	140 00	190 00

* Republished from Consular Reports, No. 17.

† Calves selected for working purposes are castrated at two months of age.

‡ Bulls four years old are kept apart for one month to fatten, and may increase 140 pounds weight and be sold at from \$16 to \$18 per cwt.

§ Cows eight or ten years old, no longer used for breeding, are kept three months for fattening, and are susceptible of 250 pounds increase in weight. Price, from \$8 to \$14 per cwt.

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These cattle have very long and straight backs and well-rounded bodies; neck very thick, with abundant mantle; head light and clear cut, with short and thin horns; ears long and flesh-colored inside; legs rather large and strong, and placed well under; hoofs well proportioned, and not too straight; tail quite short, and black at the end. This black and silver color extends over the muzzle, along the back to the rump, when it ceases and appears again at the end of the tail. The color of the hair is a silver white, very thin, and abundant.

The principal markets for these white cattle are Arezzo, Castiglione, Fiorentino, and Tojano della Chiana in the province of Tuscany. Annual fairs are held, beginning after harvest time, about the middle of August, and generally increasing in importance until December.

I have made inquiries as to the cost of transportation by steamer from the nearest port, Leghorn, to New York, and in reply the agent of the Anchor Line informs me that \$50 per head is charged, the shipper providing all fittings, stalls, boxes, fodder, and attendants, the ship only providing water. This line of steamers is very good and the cattle can be well accommodated on the upper deck. The length of voyage is about twenty-six days.

J. SCHUYLER CROSBY,

Consul.

UNITED STATES CONSULATE, .

Florence, May 20, 1882.

CATTLE IN VENETIA.

REPORT BY CONSUL NOYES, OF VENICE.

GEOLOGICAL FORMATION OF VENETIA.

The Venetian territory would seem at first glance specially fitted by nature for a grazing country. The large proportion of its surface occupied by hills and mountains of moderate elevation, the abundance of its water courses, the nature of its soil, often of superior fertility, and everywhere good for forage, are all in its favor. These advantages, however, are subject to a serious drawback in the dry heat of the climate, unless the want of moisture be supplied by a generous irrigation to combat the danger of destructive drought. Without this the prosperity of live stock will always be uncertain and its multiplication limited.

An idea of the general character of the region is suggested by the fact that it contains a large part of the southern water-shed of the Alps, and several of their loftier peaks, together with the delta of the great north Italian rivers. Few portions of Europe offer such extreme contrasts of scenery and situation, and though the Italian climate and the community of an ancient civilization do much to soften the discordances of local influence, so completely opposed, there must still remain a great diversity in the conditions of life.

Geologists agree that the Alps were among the last upheavings of the primeval sea, and that their enormous masses are little else than the fossilized remains of its animal life. They also tell us that this upheaving was the result of intermittent volcanic action continued during the Tertiary period, and underlying the whole area of Italy; gradually subsiding to the north as the surface fixed into its present form, but show-

ing its last extinct craters in the Roman Campagna, and its last eruptions at Vesuvius and *Ætna*.

Toward the close of the Tertiary and at the commencement of the Quaternary, the Venetian Alps presented very much the aspect of the Fjords of Norway—the sea washed their bases and penetrated into every opening to the foot of the great glaciers which descended between their precipitous spurs. The melting of these glaciers, with the altered temperature of the region, left in the deeper cavities the masses of imprisoned water which now form the Italian lakes, and with the dispersion of their abandoned moraines commenced the formation of the Lombard and Venetian plain.

The composition of this alluvion shows everywhere the material of the mountain sides from which it is derived. Its arrangement depends on the capricious action of the streams which transported it, as well as of great inundations, which have changed its whole surface at intervals. At its eastern limit, where the margin of plain grows narrower and slopes more rapidly to the sea, the variations of soil and surface become more frequent, as the rapid torrents change their course and deposit their coarser detritus in fresh localities, carrying their fine sediment to the lower levels, still half submerged by the Adriatic.

THE PROVINCE OF UDINE.

This narrow seaboard, with the broader region of the Carnic Alps stretching north and east to the Austrian frontier, forms the province of Udine, still known as the ancient Friuli.

It is composed, in the plain, of tracts of barren clay, passing into more fertile mixtures with calcareous matter, everywhere sown with gravel, beds of which occur constantly in the surface as underlying it at various depths. At a distance from the water courses the soil, with a smaller admixture of gravel, becomes more fertile. Along the lowest border are small tracts of rich alluvion, soon sinking into salt marsh, liable to inundation from the sea with the unusual persistence of a strong southeast wind. The mountainous portion of the province or Carnia is a confusion of narrow and sinuous valleys and irregular hillsides, with a considerable surface of vegetable earth in broken masses, mostly of schist and limestone, with rare apparitions of granite and tufa, affording tolerable pasture in nearly every part. A few of the summits of the region approach a height of 9,000 feet. Gemona, the principal town, stands at 932 feet above the sea, and villages are found at 2,100 feet.

The medium temperature is 18° to 20° C. in summer, 2° to 3° C. in winter, with a minimum of 15° C. in the last thirty-eight years. Rain and hail are frequent, and grow more so with the destruction of forests.

MOUNTAIN AND PASTURE LANDS OF UDINE.

All reports concur in stating the cultivated meadows at about one-sixth of the arable land in the plain, planted with lucern principally, and, unmanured or cared for, they give an average of forty quintals to the acre. These meadow grasses, lucern and clover, were only introduced here toward the beginning of the century, and their cultivation seems little understood. In the more fertile soil of the sea-side a better quality of forage and a more careful cultivation is found on the estates of a few large proprietors, and here the improvement of the stock has been pursued with growing interest. Some remarkable products are shown

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In the mountains the *cultivation* of forage is much more extensive, embracing about 30,000 to 40,000 acres, besides natural pasturage everywhere, in the valleys and lower hills excellent, of inferior quality in the heights. The whole of this region is full of busy pastoral life, but of the most primitive description, and far from prosperous as it should be with such facilities and more improved methods. Irrigation is rare, confined to cases where some mountain brook can be turned in a few fields, and manure all reserved, where it is possible, for the scanty plantation of cereals.

HERDING AND DAIRYING IN UDINE.

During the summer months some 25,000 head of cattle graze on these pastures, partly belonging to the district and partly to the plain below, the best tracts of pasture being rented by speculators, who make a business of conducting them to these heights, combining with this industry a considerable fabrication of dairy produce, receiving half the milk and product as the price of pasture and fabrication. The cheese is said to be excellent, and is of three kinds: *Grasso fresco*, *di conserva*, and *card* or *magro* for consumption on the spot. This, with the butter, is largely demanded in the low country, where no production of the kind exists, and finds its way in smaller quantities to Venice and Trieste. The last official reports state the commercial aspect of their industry to be discouraging. In only one or two districts is there any satisfactory sale or demand. It is impossible to ascertain the proportions of milk and product, the proceeds being entirely primitive and rustic, with no attention to any system. The yield of milk is stated at 9 pounds per cow at the highest limit, and, with fresh pasture; later in the season or in advanced gestation, it descends to 7 and to 4 pounds. For cows without milk the price of pasture for the season (from June 1 to September 1) is \$1.40; if under three years, \$1; for calves, 60 cents.

CATTLE OF UDINE.

The cattle of these mountains are an indiscriminate mixture of all the races of the neighboring pastures—Tyrolean, Styrian, Carinthian, Belianese—grafted in the domestic animal, vulgarly known as the *friulana*, largely represented here, but belonging more properly to the lower plain, and one of the numerous varieties of a race of animals now predominant in every part of Italy. The Polisine, Reggian, Pugliese, Roman, Tuscan, &c., all bear the persistent stamp of the same great family, modified by influences of climate and situation.

Professor Keller, of Padua, citing an authoritative work of Pabst, "Instruction and Guide to the Breeding of Horned Cattle," says: "Extending from the steppes of Eastern Europe and Asia, there is found in Podolia, the Ukraine, Volhynia, Hungary, Moldavia, Wallachia, Transylvania, and Southern Russia, a typical race, widely diffused, extremely apt for labor, fairly capable of fattening, yielding in particular abundant and excellent suet, but little milk. Spreading into regions so extended and various in soil, forage, and other conditions, one meets many gradations of this race differing in weight, physical constitution, &c. The essential differences which remain constant indicate two subdivisions, the Hungarian-Transylvanian and the Podolian-Moldere. The former is among the heaviest of existing races; the second is lower in stature, with shorter horns. As a rule, there is no worse race for

the production of milk, but though in small quantity their milk is extremely rich, and in Hungary are occasionally found excellent milch cows. This deficiency may be explained by the fact that in their original home the animals are rarely or never milked. On the other hand, this race gives the best of animals for labor and is valuable for slaughter, not only for the superior quality of its flesh, but the abundance of suet in comparison with other races." The defects of this animal, more or less persistent in all modifications, besides the scarcity of milk, are: head too heavy, with a neck excessively long, depressed ribs, the back narrow, and the limbs long and ill furnished with muscle. This is the original type of most of the Italian races, and, more or less altered by long domestication and indiscriminate mixtures, it is the prevailing element of the stock of this region.

Another and less numerous group is found only here and in certain parts of the provinces of Parma and Piacenza, smaller than the above, with a uniform coat of red or reddish-brown, amber-colored horn and hoof, rose-tinted lip and nostril, and white eyelids. Showing no affinity with any of the Alpine or Podolian types, it is generally conjectured to be a relic of the aboriginal race, the *bos italicus* described by Latin authors and figured on ancient monuments. The animal at present is said to be inferior for fattening, fairly good for labor, with a tolerable yield of milk. Specimens were presented at the Universal Exhibition of Vienna in 1873, but were reported to possess no special merit of any kind, while open to objection for disadvantages and diversities of form and under size.

These animals seem to answer the present requirements of the country; with the broken and difficult nature of a large portion of its surface, the want of irrigation and the imperfect cultivation of the remainder, the region seems suited for animals of general usefulness, indifferent to hardships and privation.

IMPROVING UDINE CATTLE.

The spirit of improvement, however, is active and growing. The agricultural community are earnest in seeking the best means of improvement, and the essays so far made have been attended with a success which attracts general attention and interest. Independently of private experiments, the provincial administration has expended \$10,000 during the last few years in the acquisition of choice reproducers, bulls and cows, afterward transferred to private breeders. The cross considered most successful so far is with the Swiss race of Freiburg.

The province just described is one of the largest in the kingdom, embracing all varieties of surface and a large portion of the Alps, which form its eastern extremity. It is mostly a pastoral region, but in the proportion of cattle to its surface ranks only sixth in the Venetian group, possessing 21.2 to the square kilometer, while the average is 25, with the same inferiority in the character of its races, and a greater variety of bastard and nondescript mixtures.

CATTLE IN TREVISO.

The adjoining inland province of Treviso falls below it both in number and quality of stock, offering only a wider field for the propagation of the same nameless medley of subraces, generally variations of the Podolian, which always seems to displace other animals in the hot and dry plains by a sort of natural survivance. This region, lying almost

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entirely in the plain, is in high cultivation. Its norther border, including the last foot-hills and slopes, and sheltered by the Alps, which here reach greater elevations, is specially suited by soil and southern exposure for vine growing. This is at present the prevailing interest of the province, and absorbs public attention to the prejudice of other improvements; so that cattle-breeding, which had never received much attention before, seems likely to receive still less in the future. It is complained that the present stock is not sufficient for manure, and hardly for tillage.

CATTLE IN THE PROVINCE OF BELLUNO.

The province of Belluno, extending north of this to the ridge of the Alps, is of more interest. Here nature has made pastoral industries a necessary resource for a large proportion of the inhabitants; and, pursued with increasing zeal and intelligence, they are gaining importance as a means of prosperity for a region proverbially destitute. Without the great summits or lofty plateaus of the central Alps, it belongs to that zone below the limit of eternal snow attached to the flank of every great mountain range, where the ridges become broken and tormented, and the torrents lose themselves in deep gorges, often more inhospitable than the broader elevations above. This region, known as the Dolomite Alps, is celebrated for the violence of its dislocations and the ravages of its streams and ancient glaciers, aided by the destructible material of its rocky masses. Nineteen of its peaks rise to a height of 9,200 feet, more or less; eleven surpass it, reaching an extreme of 10,266 feet. Vegetation ceases at 5,800 feet, human habitation at about 4,575, and cultivation at 4,000. Deposits of vegetable soil are rare and insecure, being always liable, even in the most favorable localities, to be swept off or buried under masses of gravel by the frequent inundations. Only about one-thirteenth part of the surface is capable of any kind of cultivation, the rest being largely occupied by forests, and, leaving out of calculation spaces of totally barren rock, five-sevenths of the whole is pasture land.

The lower and more cultivated valley, particularly that around Belluno and Feltre, the principal towns, offers a soil of moderate fertility, argillaceous calcareous, reposing on a varying substratum of marls, conglomerates, and coarse glacial detritus. In the rest of the province the calcareous element prevails more generally than in other parts of the Venetian territory, from the immense masses of dolomite limestone which crown all the mountains of the region, exposed in cliffs and walls, and which give it its striking character. These easily disaggregated masses, interrupted occasionally by volcanic irruptions of porphyry and beds of tufa, more rarely by deeper-lying masses of green and red sandstone or schist, form the geology of the mountains.

The climate, though softened by southern exposure and by the absence of great accumulations of snow during part of the year, has not the mild and equable temperature of the Venetian plain—the average ranges 3 degrees lower in the southern valleys, and in the higher districts has all the severity of alpine nature, with a medium temperature of 6.92° C. and snowfall of 146.4 C.

All these data suppose a rude pastoral life, merging into that of the neighboring Tyrol, of which the province is indeed but the southern extension, and the animals of the region bear the same stamp of relationship. The resemblance is so close that it is an unsettled question whether the type known as the Bellunese is not a simple modification

of the Tyrolese. Both are of middling stature, with the coat of uniform color and short-curved horns; both are very much inferior to the Swiss as milk producers, with excellent qualities for labor and fattening; and the meat of both, with the same forage, has the same texture and flavor. Add to this the effect of contact and intermixture for so many centuries, and their present affinity hardly admits a doubt. The special traits of the Bellunese are a shorter head, with the ear much smaller, and the eye more prominent and vivacious, the chest broader, and the ribs more open and rounded. He is more short-coupled, with limbs shorter and thicker at the knees; his coat is more decidedly gray, while that of the Tyrolese is tawney and whitish, with a thicker and more porous skin, and the horns less robust and of a lighter tint of black. The Tyrolese cow gives rather more milk, but both races are docile and enduring for labor, while the Bellunese has a special tendency to fatten, and a remarkable precocity of development, attributed to the abundance of terrous oxides furnished by the rocks (dolomitic and calcareous carbonates) of these mountains. At two years the bull is apt for procreation; many assert that he is so at eighteen months; at the same age (two years) the ox is capable of hard labor, and at three years commands the highest price for slaughter; it is rarely the case that heifers are not impregnated before the end of the second year. It is quite possible that this precocity may not persist in the race when removed from its native locality, and it is liable to entail a corresponding tendency to early decline.

Some breeders assert this animal to be superior to the Tyrolese, and propose to adopt it as the type best suited to the region, improving it by selection, without further mixture of foreign blood, unless perhaps with the view to obtain a better yield of milk in certain districts. A bull of this race has been installed as official reproducer by the agricultural board of Conegliano and the surrounding region in the neighboring province of Treviso, and others are to be found in Padua and Vicenza. In the meanwhile the commercial importance of the stock is attested by the growing demand both for labor and slaughter in various parts of Italy, and the sale and exportation of nearly all the annual production of beeves and bullocks, together with a sixth of the cows.

The whole subject of breeding and treatment is becoming the dominant interest of the community. The provincial administration maintains four veterinary stations at different points, where competent specialists not only superintend the management of animals and report on their condition, but hold a school for instructing the population in the best modes of care and management. Private proprietors are paying more attention to the improvement of their stock, and reproducing stations, maintained by communal authorities, are becoming frequent. The Government in Italy does not implant such stations directly, but encourages their creation by prizes and subsidies to the ingrativ of individuals or associations. The same zeal is shown in the construction of stables on a better system to replace the pestilential hovels where the animals and the peasant family formerly sought shelter and warmth together, at the expense of health in the long winters, as well as of sheds necessary for protection in the bleak mountain pastures.

An indication of the progress made is found in the expressions used in an inquest formerly made on the subject under the Austrian Government, speaking of the cattle of Belluno; "These animals in four or five years' time reach only a middling size, and are not susceptible of further growth without choice and costly food. The traders of the department of the Tagliamento (Udine) buy both oxen and cows, which, transported

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to a region of more succulent forage, resume their growth, and give a large profit to the purchaser. In consequence the district, although possessing an inferior race, is always sure of a ready sale for it."

Under the title "forage" occurs the following: "Some few farmers have commenced the cultivation of lucern (*medice*). The peasants find great difficulty in drying this grass so as to prevent the pulverization of the leaves, a difficulty they cannot surmount for want of an acquaintance with the proper method of proceeding in the case." These short quotations comment each other; at present lucern and clover are cultivated wherever cultivation of any kind is possible, though the product is still far from large. In elevated regions they are replaced by natural forage so wholesome, nourishing, and aromatic as to render the extension of artificial meadows almost useless.

The plants which occur most frequently in these mountain pastures are, *Phleum alpinum*, *Alopecurus gerardi*, *Agrostis canina*, *Sisleria cærulea*, *Poa alpina*, *Festuca duriuscula*, *Koeleria grandiflora*, *Trisetum flavescens*, *Aira flexuosa*, *Agrostis vulgaris*, *Nardus aristata*, and in still more elevated positions the *Agrostis alpina* and *rupestris*, and the *Arenascheuchzeri*.

The arable surface of the province is 30,000 acres, and that producing forage of all kinds, 175,000; of which temporary cultivated meadows take up 8,000; permanently cultivated, 42,000; natural pastures, 124,000.

Finally it may be said that the cattle of this province appear to be assuming the consistent and distinctive character of a special race, sought and imported as such into the surrounding region. Whether it will supplant the Tyrolese, so generally resorted to for breeding and slaughter, is doubtful. Whether it possesses merits sufficient to make it desirable for importation into the United States is more doubtful still, in presence of the pure Tyrolese, which seems to preserve in a higher degree its special race qualities.

DAIRYING IN BELLUNO.

Another effect of the same progressive impulse has been the introduction of a better system of dairy industry. The prevailing accounts from every quarter of this Venetian territory represent this class of production as being everywhere more or less neglected, or, at best, fabricated by the most antiquated methods to suit the rough taste of the country consumer, in most cases for family use only, and not of a quality to find a market abroad where there was a surplus to export. The modest export from the province of Udine has already been mentioned, and here, with the moderate product of milk and the scarcity of other resources, something more could be added to the economy of the region. This is now taking a practical form, thanks to the intelligence and energy of a parish priest of the valley of Agordo, who, in imitation of the Swiss "chaléts" and of the "fruiteries" of the French Jura, founded the first associated dairy, "Latteria Sociale," in his village in 1872. The idea was simple, and immediately realized a sensible advantage, and it has since extended as rapidly as could be expected in this isolated and difficult region. A community or a neighborhood contribute the modest means at their disposal for installing a boiler, a store room, and the few necessary implements, the most improved possible, and employ an experienced practitioner to carry on the industry. They then bring in their surplus milk daily, of which a strict account is kept,

and, at the end of the season, receive in exchange a proportionate share of the product, or, at choice, a credit on the establishment, which undertakes to dispose of the merchandise. The advantages are the profitable employment of much surplus milk, which would otherwise be lost or wasted, a more economical fabrication, and a better disposal of the product by the agency of the establishment.

A recent account estimates the gain thus realized on a hundred kilograms of milk about as follows:

One hundred kilograms of milk would give:

Articles.	Handled at home.		At the associated dairy.	
	Quantity.	Value.	Quantity.	Value.
	Kilos.		Kilos.	
Butter.....	8.00	\$0 03	3.400	\$1 41
Cheese.....	7.00	1 05	7.50	1 24
Curds.....	3.00	30	3.500	40
Total.....		2 28		3 05

Supposing the quantity of milk disposable to be about 24,000,000 of kilograms in the province, the product, amounting in the first case of home fabrication, to \$547,200, would be increased by the "dairy" system to \$735,360, a gain of \$188,160.

In 1880 there existed forty of these dairies, in more or less prosperous operation, and public opinion favored their multiplication. It is supposed that at least two hundred and fifty of them would find advantageous conditions in the province. Some stress is laid on them here as representing the first introduction of co-operative industry of this kind in the region.

It is contested in some quarters, however, whether their products can ever compete for quality with those of Lombardy and Switzerland, on account of the inferior nature of the forage, and this drawback is apprehended by their promoters; but even if this be so, they will always find a large home and regional demand.

Operations and results of some associate dairies in the province of Belluno, for eight months, from October 1 to May 31.

Commune.	Number of cows.	Number of days.	Quantity of milk brought in.	Total product obtained.		
				Butter.	Cheese.	Curds.
			Kilos.	Kilos.	Kilos.	Kilos.
Agordo.....	215	165	112,519.000	3,613.000	7,000.000	2,820.000
Falcade.....	63	103	42,400.000	1,401.180	3,184.800	1,273.800
Canale.....	122	267	84,035.600	2,062.000	6,680.000	2,539.000
Vallada.....	17	90	6,432.000	197.000	499.000	174.000
Voltago.....	104	180	78,750.000	2,575.000	6,208.000	2,362.000
La Valle.....	115	203	63,889.100	3,203.700	6,795.000	2,485.500
Hurenzo.....	187	168	114,749.650	3,281.780	9,457.803	4,608.000
Hurenzo.....	49	146	20,930.350	744.710	2,078.600	1,126.30
Hurenzo.....	98	180	50,447.250	1,794.550	4,575.050	2,388.700
Hurenzo.....	188	187	110,947.450	3,058.660	9,655.770	4,677.830
Sosperolo.....	16	60	4,057.000	128.500	277.000	30.000
Forno Zoldo.....	72	51	7,649.600	238.769	527.000	250.500
Dolmegge.....	208	163	152,084.000	3,390.270	11,378.080	5,111.000
Pieve.....	95	210	78,155.150	1,844.850	5,882.550	2,875.650

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Operations and results of some associate dairies, &c.—Continued.

Commune.	Selling prices.			Total value.	Product per 100 kilograms of milk.			Temper- ture of milk room.	Average num- ber of hours before skin- ning.
	Butter.	Cheese.	Curds.		Butter.	Cheese.	Curds.		
	<i>Livs.</i>	<i>Livs.</i>	<i>Livs.</i>	<i>Livs.</i>	<i>Kilos.</i>	<i>Kilos.</i>	<i>Kilos.</i>	°C.	
Agordo.....	2.03	0.95	0.60	16,060.65	3,200	7,110	2,500	7.5	36
Falcade.....	2.00	0.95	0.73	6,757.80	3,300	7,500	3,000	8.0	36
Carnale.....	2.00	1.40	0.70	17,005.00	3,500	8,000	3,000	8.0	30
Vallada.....	1.70	1.00	0.70	955.70	3,000	7,700	2,700	7.0	42
Voltago.....	3.12	0.95	0.60	12,770.55	3,300	7,900	3,000	7.0	36
La Valle.....	2.07	0.92	0.53	14,387.40	3,510	7,240	2,648	5-15	30-24
Flurenzo.....	2.00	1.00	0.70	24,021.04	2,860	8,242	4,000	3-5	24-12
Flurenzo.....	2.00	0.75	0.60	5,060.06	2,780	7,720	4,150	5-6	24-12
Flurenzo.....	2.00	1.00	0.70	12,581.27	3,180	8,007	4,200	7.0	24-12
Flurenzo.....	2.00	1.30	0.70	21,014.31	2,550	8,050	3,900	7½	11
Soperto.....	1.90	1.00	0.70	581.35	3,100	6,890	2,116	8.0	18
Forno Zollo.....	1.82	1.00	0.70	1,136.56	3,357	7,475	3,563	20.0	22-11
Dolnengo.....	1.00	1.50	0.60	20,500.23	2,220	7,430	3,350	.....	12
Piave.....	2.00	1.35	0.55	13,171.92	2,360	7,600	3,680	10.0	20

NOTE.—By substituting pounds for kilograms in the columns of quantities, the relative results will be more speedily realized by the American reader.

PROVINCE OF VICENZA.

The region just described, embracing the valleys of the Piave and its confluent, is the only wholly Alpine and pastoral province of the territory. The Austrian frontier, now advancing suddenly southward to embrace the disputed Trentine valley, crosses the Brenta only 16 miles from entrance into the Venetian plain at Bassano, leaving the last mountain spurs to form, with the broad terrace at their feet, the province of Vicenza. The Brenta and the Astico, in close proximity at their sources, diverge immediately and inclose between them the Alpine portion of the province, the peculiar district known as the "Seven Communes," assigned by tradition as the refuge of the Cimbri, defeated by Marius, and inhabited at present by a population speaking an ancient Suanbian dialect, a bleak plateau of about 48,000 acres, with a nearly uniform elevation of about 3,200 feet, girdled by mountains of from 6,000 to 7,000 feet, and its chief town, Asiago, 2,900 feet above the sea. Exposed to the prevailing northwest wind from the snows behind, the mean annual temperature is 7° C., with a maximum of +26° 1 and a minimum of —18, while the meeting of this cold current with the equally prevalent moist sirocco from the plain below causes an abundance of rain, unknown to any other part of Italy, a medium rainfall for three years of 1,703.9 millimeters toward the center, and of 2,019 at its southeastern border. This remarkable humidity and the excellent soil derived from the cretaceous and dolomitic masses, tufa and red sandstone of the surrounding peaks, produce a luxuriant growth of forest and pasture, and make this the grazing region of the whole province.

MOUNTAIN HERDING AND DAIRYING IN VICENZA.

The cattle of the lowland are driven here in great numbers to pass the summer months, and the irregular fabrication of dairy products during this "montication," as it is called, represents nearly all its industry of the kind, the plain being taken up with the cultivation of cereals. This mountain industry recalls that of Belluno, but in better conditions.

The pastures are excellent for air, topography, and herbage. The breed of cattle, not native, but a long-domesticated race of Tyrolese and Swiss, the cows of the district being Swiss and the best milkers in this part of Italy, the lowland cattle, an old stock crossed and recrossed with Tyrolese till the race has become general throughout all the northern part of the province. They are strong, thick-set animals, with small horns, short, thick neck, and muscular limbs; enduring, but slow and heavy in their movements; the coat whitish or light gray. The Swiss cows are much lower in stature, a darker gray in color, or spotted black and red according to their origin; not more than $4\frac{1}{2}$ feet in height, with delicate limbs and voluminous dugs. Along with these domesticated Swiss cattle are numbers of more recent introduction belonging principally to the district of Vicenza, and modified from their primitive type by long residence there. Of a peculiar breed from the Val Rendana, where they are bred expressly for milking, they are known here as the cow of Schwytz. With a soft and pliable skin they have a coat spotted with brown and black; around the eyes, inside the ear, the line of the back, and the dugs, white; with the hinder part larger and heavier than the shoulders, and a height little over four feet; light-boned, with a small head and short horns. These cows have an extraordinary milking capacity, but very variable with the quality of their forage. In Switzerland they are said to give as much as 27 liters, or 7 gallons, per day. Here the same animal gives only 5, and her descendants 2 to $2\frac{1}{2}$ at most.

Of these and the migratory herds from below, some 10,000 cattle are collected here during the summer months, of which 5,500 belong to the district, with 1,500 calves. They are guarded by the proprietor or tenant of the land, who undertakes their keeping either for a rate in money or a share in the products of a dairy attached to the pasture, which makes a part of the speculation. The milk of the herd is collected here twice a day; and being operated on in the best conditions of freshness and temperature, gives a large yield of butter and cheese much esteemed in the neighboring provinces. Ordinarily the price of pasturage, when taken in kind, is one-half of the milk and product; for cows without milk, \$5 to \$6, according to abundance and quality of forage. The yield of milk varies with the state of the pasture and of the animal, better and more abundant at the outset with grass uncropped and diminishing as the season advances. Averaging this difference, an ordinary cow is supposed to give 4 to $4\frac{1}{2}$ liters of milk per day.

BUTTER AND CHEESE MAKING IN VICENZA..

In 107 of these mountain dairies are made three kinds of cheese. For the "Grasso da frutta" the milk is used unskimmed and entire, and in the early season produces 33 pounds to the hundred liters= $26\frac{1}{2}$ gallons; later, 20-22. In one of these pastures, celebrated for the quality of its products, a small portion of butter must be removed, the excessive richness of the milk making the cheese difficult to keep. After this the "pecorino"—half cream—and the "magro," of skimmed milk, are made for the use of the neighborhood. Of "magro" a hundred liters of milk give about 22 pounds; each pound of butter taken from the milk lessens the yield of cheese by 2 pounds.

In full season the same quantity of milk gives $9\frac{1}{2}$ pounds of butter, more or less, according to the quality of forage. The methods of fabrication are those of the farm-house, without a thermometer or other rational instrument, depending entirely on the tact and experience of the dairy-

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man, but the material is so good and so liberally employed that these products furnish most of the lowland consumption, and are beginning to be sought in its markets for exportation. This district contains about 44,000 acres of natural pasture, with little cultivation of any kind, the rest of its surface being covered by forests.

DAIRYING IN THE LOWLANDS OF VICENZA.

Here and in the lower province the cows, during the autumn, winter, and spring, give little more than a half ration of milk, and the insignificant production of half-skimmed mezzo-magro cheese is consumed at home. They are kept, in the lowland districts, mostly in the stable by the proprietor or by an industrial, who follows up his trade in the mountains, rents the cow-house and buys forage of some farmer short of cattle on a singular traditional contract, which gives him right of pasturage after the first cutting, straw at discretion, about a cord of wood and 150 faggots for every 12 loads hay he buys, and 1 liter of wine every holiday. In return he gives all the manure at the end of the season, $1\frac{1}{2}$ pounds of cheese, and the same weight of butter for each load of hay.

The cows are not fed on straw stubble or Indian corn leaves, as are beeves, but on grass and hay from natural meadows. These cow-houses are mostly confined to the district of Vicenza, and are all very much on the same plan, a long, low construction, with a file of animals on each side, separated by low partitions of wood 3 feet 2 inches high and 5 feet 8 long, leaving between them a stall 6 feet 6 wide for two animals, with a flooring raised 6 or 8 inches from the alley of 5 feet wide down the middle; grated windows over the heads of the cattle, sometimes glazed in winter. The calves are tied up promiscuously at one end of the stable in a space left for the purpose.

All this lower section of the province, the summer residence of wealthy families from the neighboring cities, and containing an unusual number of their large estates, shows at once the benefit of such a class of proprietors, many of whom occupy themselves with the breeding of cattle, so that by their example as well as their immediate agency the breed of the country has been nearly transformed.

The climate of this region is one of the best tempered of the territory, free from the excessive humidity of the plateau above and less subject to the long droughts of the lower plain. The difference from that of the mountain district just described is strongly marked by the advance of from fifteen days to a month in the harvests.

At Vicenza the medium temperature is 54° F. for the year, with an ordinary cold of 20.1 at the lowest in winter, and an average heat of 87.1 for midsummer, and a very regular transition of seasons; injurious droughts rare, except in the most southern districts.

In the valley of the Brenta, the soil, mostly calcareous, is only of middling quality, but there is considerable cultivation of forage, and the breeding of cattle is followed with a care and intelligence that make Bassano, at the opening of the plain, an important cattle market, and the interest in this industry increases in descending to the neighboring province of Padua, which is its principal center for Venetia.

West of the Brenta the torrential impetuosity of the streams which traverse this intermediate region between plain and mountain, and particularly of the Astico, has accumulated a deposit of the glacial detritus of the upper valley, making the subsoil of this central portion of the province little more than a bed of stones and gravel, sometimes varied

by a rough conglomerate of the same materials thinly covered by a layer of vegetable soil rarely reaching the depth of one-half yard, sterilized by the porous nature of the mass below, and by the frequency in certain localities of springs and subterranean streams. This quality of soil permits a considerable growth of forage, and the district of Thiene supports a number of cattle little inferior to that of districts more generally fertile.

The territory remaining to the west of this and forming the more elevated portions of the province of Verona offers the same general character, and may be regarded as an extension of the same region. Its alps show much the same broken stratification, with a predominance of cretaceous rocks, and more frequent irruptions of prismatic and amorphous basalt and basaltic tufa.

Beyond the Adige the transition to the Lombard plain is formed by the moraine of the great glacier which once occupied the bed of the lake of Garda, through whose confused masses of gravel and bowlders of all sorts and dimensions the emissary stream, the Mincio, has worn its bed, often deeply incased, toward the lowland of Mantua.

FROM MOUNTAIN TO LOWLAND STOCK-RAISING.

The soil of this province, a portion of the same alluvion, with the western part of that of Vicenza, formed by the confluent of the Adige, an elevated and rather undulated plain, is generally fertile, and being deposited by smaller streams, presents less broadly marked differences of composition in neighboring localities, always subject, however, to the general law that its materials are coarser and less mingled on higher levels toward the points where the streams, issuing from their mountain valley, deposit their heavier burden, carrying their finer sediment to form a deeper and richer soil below. A chemical analysis of the soil found at base of the hills, at nearly equidistant points of this region from east to west, will give an idea of the material which enter into its composition.

Ingredients.		Near Ronca to the east, basaltic.	Near Vo- rona, cal- careous.
Silicic acid	parts		
Calcareous carbonate	do.	70	45
Alumina	do.		28
Organic matter	do.	13	8
Ferrie acid	do.	5	7.50
Lime	do.	4.50	6
Phosphate of potash	do.	3	
Magnesia	do.	2	
Alkaline salts	do.	1	
Water and loss	do.	1.50	2.50
Total		100	100

The same races already described are still in presence here, less mingled and incorporated than in the regions further east, partly because breeding has been less active and thorough, partly because the province of Verona extending farther into the bottom valley of the Po, the specially Italianized race of the "*Pugliese*" seems the only animal that holds his ground and still prevails almost exclusively.

In fact throughout the territory the whole subject of crossing and improving breeds is still disputed and uncertain. Some years since the provincial administration established several reproducing stations, but the results did not correspond to the considerable expense incurred, and

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the intervention of the authorities was transformed into a system of annual prizes for the encouragement of private enterprise, to be adjudged to the proprietors of the best bulls and their products at the regional cattle shows. This system seems to have answered better, and each year the animals offered for competition are more numerous and deserving.

The annual migration to the heights is practiced, but without system or regularity and in all other respects this region has no special feature of pastoral industry to command attention.

All this tract of country is occupied by an extensive cultivation of cereals often without intermission, the least possible space being allotted to forage, which is generally planted along with the grain. The extent of natural or permanent pasture is insignificant, and but a small proportion of the surface is allowed for temporary and artificial meadows by the more intelligent proprietors for the purpose of special breeding, or for the necessity of rotation, never exceeding one-fourth and averaging more generally one-tenth. In the lower districts of Verona from 5 to 8 per cent. of the surface is irrigated, an improvement much more rarely found further east.

In this exclusive cultivation of grain, which has been the fixed idea of Italian agriculture for some years past, cattle are only taken into account for the needs of labor and manure. As a food supply the ox has had, until recently, no practical importance, costing too much for the consumption of the labor alike in town and country, and finding but a limited demand for the few who could afford such luxury in the towns. By the rural laborer it was used at rare festivals only, and cases are cited of *contadini* who asserted that they had never tasted meat. The growing international demand shows its effects so far only in those districts where cattle production is a necessary resource, and there is found in passing from the highlands to the bottom valley a regular decrease of stock for a given area, four oxen being the average in the one case on a farm of 15 to 30 acres, while in the lower plain the same number serves for one of 40 to 55 acres. Here the only commercial product looked for is the sale of the calves, each cow bringing in this way an average gain of 120 lire=\$24, and the calf, if not sold at the teat, must get his living on roadsides and ditches; if sold younger he brings only \$15, and if better fed he is still less profitable, so that the average remains about the same.

In the same transit from north to south, and from hill to plain, takes place a gradual change of races, the Tyrolese, Swiss, and all their mixtures giving way to the Podolian, which here balances other types, and further on along the lower rivers and coast, and it may be said in the rest of Italy south of the Po, is the exclusive race of the country.

CATTLE IN THE PROVINCE OF PADUA.

This province is in every way the heart of the Venetian terra-firma, and its agriculture best represents the state of progress in the region. Its situation between plain and mountain gives an excellent average of soil. Superior wealth and culture render it more open to the possibilities of improvement, and the agrarian interests of the country at large gravitate here as to their natural center. The city of Padua is the principal cattle market of the surrounding provinces, and their breeding interests owe their prosperity in part to its neighborhood. The province is the best stocked of the territory, possessing 37 head to the square kilometer, while the general average is but 25. In the northern part of the province breeding and fattening for slaughter is pursued as a special

industry, and to a degree of system and perfection not attempted in any other part of the country. The district of Cittadella in particular is reputed for its products, and uses every art to maintain their quality. Mention has been made of the improved character of the cattle industry in the valley of the Brenta as it descends toward the province of Padua, from Bassano, which is already a center of some importance; here, beyond the confine, is its culminating point. The district is not exceptionally fertile, and portions of it toward the west are wasted by the gravel of the Brenta. Around Cittadella, in the center, it is calcareous, argillaceous, with a calcareous subsoil, is tolerably well irrigated, and produces good forage. The western border, argillaceous, calcareous, silicious, is more perfectly irrigated, and the forage is considered superior. The remaining surface to the north and east is fair vegetable soil for every cultivation, but with a rather porous substratum. To the extreme south and southwest, where clay predominates both above and below, the land is especially good for rice and forage. The latest statistics give 11,262 head of cattle, with a rate of 1 animal to 2.6 acres; 2 in every 10 are reserved for slaughter. From 400 to 1,300 animals are fattened here annually, out of 3,000, the estimated number for the province.

HOW CATTLE ARE FATTENED IN PADUA.

The number of cattle enumerated as belonging to the district are here of no moment, as a certain quantity are purchased for fattening from abroad. The treatment adopted most usually to attain the result in the shortest and most economical way is thus described: It should be premised that all practitioners do not make it a point to bring their products to a point of extreme obesity, and notable differences in this respect may be seen among animals offered in the market. With this qualification, the following is the method adopted by the most skillful and experienced breeders to arrive at a moderate result of weight and volume:

In winter, when fresh forage is wanting, the animals, with an average of 300 kilograms (pounds 660), after several days of entire repose, with ordinary treatment, are bled, in case their coat, by its want of softness and luster or any other symptom, should indicate the necessity. This being done, they are submitted to a regular and special régime, being fed with fine rich hay, clover, or the like. This is continued from one to two months, as the animals show more or less readiness to gain flesh. After this they are served with a ration of Indian corn shucks, softened in boiling water and sprinkled with linseed meal, in quantity, 11 to 13 pounds a day. During four months of this treatment two beeves consume about 3,520 pounds of choice forage and 1,100 pounds of linseed oil-cake, and attain a weight of 1,870 pounds. In the summer much the same method is followed, using, however, fresh forage, such as hay, grass in general, clover, medic, and the like, the oil cake being omitted. Use is also made of the green tops of Indian corn, and of mulberry leaves, provided these last have not been touched by frost, and thus rendered unwholesome for the animals. This summer treatment lasts nearly as long, with about the same cost and the same economical result, as the winter treatment.

To obtain beeves of still higher quality the whole secret consists in prolonging the above treatment, and those who desire extra fine products keep the animals on régime as long as six or seven months or more. In such cases a pair of beeves will consume as much as 5,280 pounds of forage and 3,300 pounds of oil-cake, reaching a weight of 2,420 pounds.

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I have alluded to the race of animals preferred here for fattening; generally and constantly the Tyrolese are thought, beyond comparison, better both for labor and slaughter in this region. The so-called Felbrini or Bellonisi are purchased, but relatively few, while the native stock, Pugliese, stand lowest; without doubt there are reasons for this, drawn from long experience. It is worthy of note that in general here, in opposition to the usage of other parts of the province, neither in the forage nor otherwise is the least particle of salt ever given to cattle; that they are curried and cleansed of every kind of filth, and their coats kept as lustrous as possible; that the stable is never entirely closed even in winter, in the belief that a constant supply of fresh air is indispensable to the animals. It is remarked that they succeed better in winter, as well in the quantity of flesh as in its flavor.

The usual practice of speculators in this industry is to content themselves with the moderate result of four or five months of the above treatment, the profits of the operation diminishing with a farther outlay; there exists, however, a sort of ambition with certain individuals to carry their products to the utmost perfection, even with lessened gain, and this emulation has done much, doubtless, to maintain the singular reputation of the locality, due in part also to the special quality of the forage. This is generally asserted, though no explanation is found of the superiority claimed.

A report from the intendant of one of the great proprietary families of the region makes a higher estimate. After stating the methods practiced in his neighborhood (sometimes much the same as those mentioned above) he continues:

The animal to be fattened should be neither too young nor too old, say from six to eight years; his live weight at the moment of putting under treatment is commonly from 1,100 to 1,320 pounds. In three months he is at half-flesh, but to put him in full condition, after these three months on green food, three months more are necessary on dry forage.

During the three months of green feeding no dry forage is given; grass alone with tops and shucks of Indian corn, &c., and two daily drafts of warm water, with 1 kilogram of oil cake (2.2 pounds). Afterward he receives about 33 pounds of dry forage divided into three rations, changing the quality at each meal; the hay should be of the first mowing; the oil-cake drafts to be continued with an addition of 17½ pounds of oil-cake. The shucks in these last three months should be peeled and dried and given morning and evening, about 4½ pounds at a time.

An animal well fattened gains an addition of about one-half his original weight, attaining to from 1,650 to 1,980 pounds; the dead weight is calculated at about 30% less. Attention should be paid to the habits and temperament of the animal, perfect cleanliness of animal and stall, abundance of litter, and constant ventilation, however cold the weather, regular currying after each meal, and after the draft, fresh water to his thirst.

Differences of opinion exist among specialists in regard to the necessity of salt as an element of diet; practically, it seems immaterial here, owing, perhaps, to the nature of the forage, which in certain situations is known to absorb a considerable quantity of salt in its growth. A strong prejudice exists, among peasant breeders principally, against currying the animals while in process of fattening, under the persuasion that every disturbance of the cuticle interferes with their digestion, and particularly with the formation of suet; the substitute being to brush the back and head, around and between the horns, with a broom or

coarse wisp of straw, an operation supposed to be specially agreeable to the animal, and thus to improve his appetite and digestion. The story is told of an illiterate proprietor, noted for his excellent products, often found in his stable extended between a pair of beeves and industriously scratching their backs to excite their appetites.

Together with, or in substitution for, the linseed-cake, the refuse of various other oily plants is used, especially the colza, said to be very nearly equal to linseed as food for cattle. Other plants of the same nature are hemp, poppy, cotton, sesame, &c.; they are all valuable for manure and often so used. It is asserted that after serving as food for animals they are no less useful, the fertilizing elements passing through the animal after serving their purpose of nutrition. (*Liebig*.) Little or no recourse is made to roots for cattle-feeding in this district, and the extremely scanty production would hardly furnish the supply. The linseed cake is considered equivalent as food to rather more than twice its weight of hay. While the general practice of breeders gives the preference to this particular plant, it is supposed that cotton seed, if available, might surpass it. Mention has also been made of mulberry leaves as a favorite article of food.

Primitive ensilage.—In the vine-growing districts, together with the fallen vine leaves, is commonly used the refuse of the wine press, the considerable residue of alcohol remaining being an excellent stimulant for fattening, though injurious in ordinary food. The mode of preparation is as follows: A round excavation in the earth, about 2 meters deep and wide, is filled with alternate layers 20 centimeters (=8 inches) thick (on a bottom layer of leaves) of "graspa" or press refuse, and vine and mulberry leaves, pressed down as tightly as possible, and covered with a "capello" or conical mass of earth, care being taken to draw a ridge of earth around the brink to prevent rain or snow from penetrating. The mass is then left to ferment, and watched, to fill any crevices in the cover of earth as it dries. In about forty days fermentation is completed, and the product is then given to the animals, which, after a first hesitation, become extravagantly fond of it, and the dose has to be regulated.

FOOD ANALYSES.

It is always observed that an animal fattens in longer or shorter time according to the origin of his forage; for instance, with the hay mowed here at Bolzonella, eight months are required for full flesh; with that of Citadella, six months; with that of Belvedere and Rosa, four months suffice.

A rough analysis of the hay grown near Citadella gives for one hundred parts of hay:

Azotated substances, 8.14, or digestible matter, 58.23.
Carbonated substances, 43.63, or indigestible matter, 27.18.
Ashes, 6.16, or water, 14.19.

The composition of colza compared to linseed is as follows:

Constituents.	Colza.	Linseed.
Proteinic substances	28.08	28.0
Fatty substances	9.5	10.0
Hydrated carburets	24.3	31.6
Wood fiber	15.8	11.0
Ashes	7.4	7.0
Water	15.0	14.7

HOUSING CATTLE IN PADUA.

Breeders complain that the principal obstacle to fattening cattle up to the highest point is the impossibility of obtaining remuneration, the meat finding no sale beyond a certain price, which varies little for all classes of product, while in England every quality has its price, thus gratifying the fastidious taste of the rich, and bringing animal food within the reach of a large population to whom in Italy it is now forbidden. It is the construction and management of stables which seem most in need of improvement here at present. Where there is any solid construction it is a model of centuries gone and often dates as far back. In the southern part of this and in contiguous provinces this may be tolerated, with the dry and equable climate, and the race of cattle proof to hardship and capable of living in the open air without injury, though with more care they gain at once in appearance and condition, and in reality the stall is here more a convenience for purposes of order and special regimen than a necessity for shelter. So that improvement in this respect will be slow in spite of the exportations of progressists, with whom it is rather a favorite theme latterly. A few wealthy proprietors have constructed stables with all the modern requisites, but there is no instance of any such improvement for industrial purposes. As might be expected the best general average is found in the neighborhood of Padua and Cittadella. The usual plan is that described above in speaking of the cow-houses of Vicenza.

DAIRYING IN PADUA.

The dairy industry is entirely insignificant; in some districts it is wanting altogether; elsewhere it is confined to the needs of the household or village. In the districts of Cittadella alone statistical reports mention, besides six associate dairies, three families as producing small quantities for commerce; they prepare principally soft cheeses for the daily consumption of Padua.

The climate of the province is gentle and equable; separated from the lagoon only by the narrowest portion of that of Venice, it is in the same atmospheric conditions, with only the slight difference that, being entirely inland, the moderating effect of the sea is less sensible, the summer heats and the cold of winter being rather more marked.

The elevation of the city observatory is 93.6 feet above the sea. The temperature rarely exceeds 32° or 33° C. or falls below 3° C., with a medium of 148.5° C. This is the ordinary year and a fair average for the province. Its lower portions sink into the deep valley of the Brenta and Adige, and assimilate in character to the adjoining province of Rovigo.

CATTLE IN THE PROVINCE OF ROVIGO.

Lying between the parallel courses of two great rivers, the Adige and the Po, probably the latest of all alluvial formations, still disputed by the water courses and the sea, this province forms a broader region set apart by nature from the districts which it divides, with a topography and an agriculture of its own. With most of its surface below the level of the rivers, which intersect it in every part, and liable also to invasion from the reflux of the tides driven by contrary winds, it must therefore be defended with constant vigilance. In portions drainage is almost impossible, and these are still left for salt marshes and meadows, in parts well reclaimed and defended; the soil, a deep

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2.08	28.0
5.5	10.0
1.3	31.6
8.8	11.0
7.4	7.0
5.0	14.7

alluvion, interrupted by intercolated beds of sand, peat, and gravel, is of exuberant fertility, and is occupied by an unsparing cultivation. This exclusive attention to plant products, with the prolonged heats that scorch neglected wastes of meager pasture between the frequent inundations, offer poor conditions for pastoral industry. Rovigo, one of the most elevated spots of the region, is 27½ feet above the sea; the medium temperature is 15° C., with a maximum of 33° .7 C., and a minimum of 3.7 and a rainfall of 0.80. Nature has furnished a race of cattle suited to such congenial conditions, and provided for their subsistence on the tracts of undrained land covered with canes, rushes, and marsh grasses along the sea-side and tide-water canals. The Pugliese exists and thrives here to the exclusion of other races, as well as in the lowest districts of the provinces of Padua and Venice. The noted agronomic, Professor Zanelli, mentions this type of animals as follows:

Along both banks of the Po, descending from Mantua to the plains of Padua, and Polesine (Rovigo), we find a race of animals of labor, domesticated in the region, which it is impossible to confound with other types—oxen of tall and middle stature, more thick-set than the ordinary Hungarian breed, and distinguished by some with the name of Pugliese. Their special marks are the coat of gray or light grayish, with small black lines on the eyebrow, lips, and edge of the ear; long and sharp projecting horns give them rather a savage aspect. The shoulders are extremely developed in comparison with the haunches, with the point of the shoulder abnormally high and pronounced, a conformation well suited for a draft animal. This race has the advantage of being perfectly acclimated in these low and marshy plains, where the pasture is often of the most inferior quality, is robust and tenacious at work, for which cows and oxen are employed without distinction.

So that this animal, descending with the barbarian invaders from the steppes of the ancient Sarmatia (*Bos primigenus*), and now, by the consent of all authorities, diffused throughout the country from Lombardy to Sicily, is the proper Italian ox. He has been mentioned above as the inhabitant of Friuli; it is equally certain that the great oxen of Romaqua, the half savage herds of the Roman Campagna, and the cream-colored cattle of Tuscany, are of the same stock with the Pugliese of the Lower Po. The race in Piedmont attains extraordinary dimensions. In a report to Government are cited measurements of cattle three years old: existing there; oxen of 6 feet 4 inches and 6 feet 6 inches, and a cow of 5 feet 6 inches in height.

Here their height rarely exceeds 5.6 to 6 feet, and their yield of meat is always inferior to that of races bred for slaughter, as well as of the Tyrolese which, besides, fatten more readily. On the other hand the type is susceptible of great improvement under favorable conditions, and a certain number of breeders here and in Romaqua maintain that it is the one best suited to the country. This may be true for the region now under consideration as well as for the rude husbandry and burning climate of Southern Italy, but under ordinary conditions of climate and cultivation in Europe, the controversy is practically decided by the choice of the breeders of Cittadella and wherever else superior cattle are required for industrial profit.

There can hardly be said to exist any management deserving attention after the elaborate methods followed in more advanced regions and described above. The ordinary practice is to leave the animals to find their subsistence on the coast lowlands, or otherwise to feed them on the indifferent products of these same pastures, at most shutting them in for the night in the huts of cane and thatch, which serve for stables in many localities. When fattening is required they receive the choicer forage grown promiscuously with the corn on small spaces of the arable land of the region.

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In the western and slightly more elevated division of the province, toward Lendinara, where forage cultivation is somewhat more extended, occupying from one-fifth to one-tenth of the surface according to localities, with a yield of 70 to 80 quintals to the hectare, the animal improves greatly and is reported to give, without taking into account the cost of land and forage, 10 to 12 per cent. on his purchase price; in the lowland of Rovigo never more than 5 per cent.

Here there is also a trifling fabrication of cheese and butter for domestic use, limited, however, by the fear of stinting the calves, which are the principal care and reliance of the farmer.

In this region some steps of improvement are made in the construction of stables, a few of a better description having been introduced by the wealthier proprietors to replace older ones fallen into decay. The greater number, however, are still reported to maintain the prevailing aspect of neglect and rusticity.

CATTLE IN THE DISTRICT OF VENICE.

Of the region in the immediate dependence of the city little remains to be said; its various districts form so many appendages to the different provinces which incircle it and share the character of their rural life. Extremely fertile to the north, where it consists of the finer sediment of the Piave, it is stocked with the mixture of Austrian and Friulana cattle which stock the adjoining districts of Udine and Treviso. The portions bordering the lagoon in the immediate neighborhood of Venice are occupied by cows kept expressly for the milk supply of the place, almost entirely of the Bellunese breed; indifferent milkers, but hardy and not fastidious in their nourishment. Some attempts have been made to introduce Swiss cows into this group, but on account of the objectionable quality of the water and forage they did not answer expectations.

The lower border of the lagoon, including Chioggia, is for all agricultural purposes a part of the low land of Rovigo, the Polesine just described, and contains the same exclusive stock of Pugliese cattle, though in number insufficient for the extended tracts of natural pasturage now utilized by large herds of mountain cattle from Belluno, which find here a cheap subsistence for the winter. In all this region no dairy industry is ever attempted, the native cows being used only for labor, and the scanty supply of milk and butter needed for home use furnished by the few cows of other races bred or imported for the purpose.

EFFECTS OF THE ITALIAN CLIMATE AND HERBAGE ON IMPORTED CATTLE.

It is significant for the object of the present inquiry that in every part of Northern Italy the fabrication of dairy products as an industry is only carried on with the aid of imported races. The Bellunese are a domesticated branch of Tyrolean, the milk cows of Vicenza and the seven communes are almost entirely Swiss, and both groups are such indifferent milk-givers that it would be impossible to bring their product into general or even local commerce without the advantage of mountain pastures at trifling cost. The Lombard dairymen, it is said, find it more profitable to import Swiss cows directly than to depend on crossing the breed, and it has been seen that the animals imported fall off immediately, so that the yield of milk never approaches that of a Swiss pasture.

All these facts point to a radical difference of local conditions, and the effect of this difference may be traced progressively. In leaving

the moist climate and fresh pastures of England and Scotland every one may observe the dryer and more concentrated quality, as well as the darker color, of French beef and mutton, though not inferior in flavor. The verdure of the country shows the same variation; both have felt the long dry summer.

In Italy this change is exaggerated; prolonged heat in summer and dry cold in winter are the rule. Luxuriant pastures in hill or valley are rare, and keep their freshness but a moment. Mountain ranges and spurs occupy much of the surface; land is divided into the smallest parcels; horses too few and precious to be employed in cultivation; intensive agriculture is little known, and its introduction can only be the work of many years. Until then the race of cattle must be adapted to all uses, principally to labor, and subsidiarily to slaughter or dairy production; and even then it is doubtful whether the climate and vegetation could offer a congenial home for the ultra-refined and developed animals of more favored regions. Attempts to naturalize them, made with all the precautions and liberality of scientific experiment, have not so far succeeded.

THE OX OF THE COUNTRY.

In the Podolian ox the country possesses a type capable of supporting its mediocre conditions of existence, and answering its principal requirements; sober, robust, and nearly equal to the horse in the rapidity of his pace in labor or journey, he demands neither care nor shelter. To correct his defects of form and temperament the other half-Italianized race of the Tyrol seems specially fitted; indolent, slow, and massive in his native region, he loses the excess of these characteristics in changing his habitat, while retaining his precocity and readiness to fatten. The influence of climate is singular manifested in its effects in these extremes of race character, which, gaining and losing, respectively, by the change, tend to a common medium of good qualities. The Podolian, however, is the proper and universal Italian ox, and in view of the extraordinary modifications already noted of the same type, it is difficult to assign a limit to his capability of amelioration.

SUITABILITY OF ITALIAN CATTLE FOR THE UNITED STATES.

Whether one or other of these races would be desirable for importation to the United States would depend on the character and the agriculture of the region in which the animals should be implanted. Neither possesses the highly developed special qualities that are sought for in the improved cultivation of the older States. If, however, the precocity and solidity of the Tyrolese were considered an acquisition, these are found at their strongest in the valleys of the Upper Adige, toward Meran, the native home of the race. The type should be chosen there, and for these qualities alone; neither this nor any other race of these regions having any value for dairy purposes to merit attention.

The hardy and indefatigable Podolian or Pugliese might render useful service in the trying climate and difficult cultivation of less fertile and less advanced parts of the country, as, for instance, in the lowlands of the Gulf States, in the wild-sage region of the great plains, or the barren stretches of Lower California and New Mexico, and, according to the special requirements of the situation, there would be large room for choice among the several varieties of the race which stock the different regions of Italy.

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Sizes

Name of breed.

Pugliese.....
Tyrolese.....
Bellunese.....
Schwytz.....
Montanina.....

PRICES OF ITALIAN CATTLE.

In regard to the quantity of cattle at present in the country and their price, they are reported to be scarce and dear in all parts of Italy and Venice, as well on account of the recent inundations as of the increasing demand, foreign and home. France and Germany require a constant supply, and for several years the Parisian market has been largely supplied with Italian beef.

Beeves of superior quality, live weight, cost from \$15 to \$16 the quintal, and this price is general throughout the region. The animal generally averages six quintals, and yields 50 per cent. net of meat. Cows bring about the same price, and never less than \$14; at half flesh the price is 55 to 60 francs, which equals \$11 to \$12.

TRANSPORTATION OF ITALIAN CATTLE TO THE UNITED STATES.

It is difficult to obtain data as to the cost and facilities of transport to the United States, the case never having before occurred. The best route would be by sea altogether, as I am assured that animals suffer more in the railway journey to Havre than in crossing the Atlantic. The General Navigation Company (Italian), with a line to New York and transshipment at Palermo, make their voyage from here to New York in twenty-five days, and state a price (approximate) of 480 francs (\$96) per head, but better terms could be made according to number of animals. Each animal would require about 22 pounds of hay per day, and for the passage 550, which, at 71 cents per quintal, equals \$3.50, which with \$96 for transport, equals \$99.50. The passage of the necessary keepers would be gratuitous.

McWALTER B. NOYES,
Consul.

UNITED STATES CONSULATE,
Venice, November 24, 1883.

Size, weight, and product of horned cattle in the Venetian territory.

Name of breed.	Habitat.	Annual average pounds of milk.	Milk to pound of butter.	Milk to pound of cheese.	Size at maturity.		Live weight.	
					Cow.	Ox.	Cow.	Ox.
Pugliese	Udine, Rovigo, Padua, Vicenza, Verona, Venice.		Lbs.	Lbs.	Ft.	Ft.	Lbs.	Lbs.
					4. 10	5½	935	1, 400
Tyroliese	Udine, Vicenza, Padua, Verona.	3, 000	27 1/8	13½	4. 8	5½	990	1, 650
Bellunese	Belluno, Padua, Udine, Treviso.	2, 850	27 1/8	13½	4. 8	5	950	1, 500
Schwytz	Vicenza	3, 600	25	11 1/8				
Montanina	Udine							

Breeds of horned cattle in the Venetian territory, and their products.

Name of breed.	Age at maturity.	Weight of meat at maturity.	Color.	Description.
Pugliese	<i>Yrs.</i> 4	<i>Pounds.</i> 710	Ash-gray, whitish, tipped with black.	Thin, high-shouldered, long-limbed, long-horned; pace, rapid.
Tyrolese	3	825	Gray or tawny	Heavy, slow, back straight, rump thick, head small, neck short, horns short.
Bollunese	2½	775	Gray, tipped with black	Thick-set, horns short, limbs short, breast broad, depression behind shoulder, precocious.
Schwytz		440	Red, brown, or black spotted	Low, head small, rump high and large, horns short, bones light, thighs large, skin soft.
Montanina			Red or brown	Undersized, horns and hoofs amber-color, light, rapid, used for transport.

Name of breed.	Origin of breed.	Labor.	Product.		
			Meat, fat tened.	Milk, per year.	Cheese, per year.
Pugliese	Steppes of Russia	Rapid	<i>Lbs.</i> 990	<i>Lbs.</i>	<i>Lbs.</i>
Tyrolese	Austrian Tyrol	Slow	1,100	3,000	210
Bellunese	Belluno and Tyrol	Good, middling	1,050	2,350	207
Schwytz	Val Rendana, Tyrol			3,000	262
Montanina	Italy	Middling rapid			

Climate and topography of the Venetian territory.

Locality.	Altitude.	Mean annual temperature.	Summer.		Winter.	
			Mean.	Extreme.	Mean.	Extreme.
Udine:	<i>Meters.</i>	<i>°C.</i>	<i>°C.</i>	<i>°C.</i>	<i>°C.</i>	<i>°C.</i>
Gemona	200	11.1	20	33.8	2.8	-15
Pordenone	30	14.8	21.5			
Cividale						
Belluno:						
Belluno	404	10.3	20.0	31.9		-11.9
Agordo		10.1				
Auronzo	900	6.9	16.6	29.6	-1.6	-17.5
Vicenza:						
Vicenza	35	13.3	24.7	35.1		-5
Asiago	990	7		26.1		-18
Bassano	129	12.7		33.2	3.3	-6.1
Verona:						
Verona	64	14.2		35	3.9	-6.4
Sanguinetto						
Padua:						
Padua	11	14.3		36.7	4.9	11.1
Cittadella	46					
Piava						
Rovigo:						
Lendinara	9					
Adria	2					
Ariano	1					
Venice:						
St. Dona		12.1	24.4	36.7	3.1	-5
Venice and Dolo	3					
Chioggia	1.1					

Udine:
Gemon
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Cividale
Belluno:
Bellun
Agordo
Auron
Vicenza:
Vicen
Asiago
Bassan
Verona:
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Padua:
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Rovigo:
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Climate and topography of the Venetian territory—Continued.

Locality.	Soil.	
	Character.	Composition.
Udine:		
Gemona.....	Alluvial.....	Siliceous, argillaceous, calcareous.
Pordenone.....	Alluvial and gravel.....	Gravel, argillaceous, calcareous.
Cliviale.....	do.....	Argillaceous, calcareous, gravel.
Belluno:		
Belluno.....	Alluvial.....	Argillaceous, calcareous.
Agordo.....	Mountain shelves.....	Calcareous, argillaceous, sand.
Auronzo.....	do.....	Calcareous, argillaceous.
Vicenza:		
Vicenza.....	Alluvial and gravel.....	Argillaceous, siliceous, calcareous.
Asiago.....	Mountain plateau.....	Cretaceous, calcareous.
Bassano.....	Alluvial.....	Cretaceous, siliceous, calcareous.
Verona:		
Verona.....	Stony.....	Argillaceous, calcareous, siliceous.
Sanguinetto.....	Alluvial.....	Siliceous, argillaceous, calcareous.
Padua:		
Padua.....	Loam.....	Siliceous, argillaceous.
Cittadella.....	Alluvial.....	Argillaceous, calcareous, sand.
Piave.....	Deep alluvial.....	Argillaceous, siliceous.
Rovigo:		
Lendinara.....	Alluvial and sand.....	Argillaceous, sand, calcareous.
Adria.....	do.....	Argillaceous, sand, peat.
Ariano.....	do.....	Do.
Venice:		
St. Dona.....	do.....	Argillaceous.
Venice and Dolo.....	do.....	Argillaceous, sand.
Chioggia.....	do.....	Argillaceous, sand, peat.

NOTE.—1 meter = 3 feet 3.1 inches. Degree centigrade = 1° Fahrenheit. 0 centigrade is at freezing point.

Substratum and cultivated grasses in the Venetian territory.

Locality.	Substratum.	Proportion to arable soil.	Cultivated grasses.
Udine:			
Gemona	Limestone; in higher parts, granite and schist.	$\frac{1}{2}$	Medic and clover, most in mountain grasses.
Portenone	Gravel, moraine	$\frac{1}{2}$	Medic, clover, rye-grass.
Cividale	Limestone and gravel, higher granite.	$\frac{1}{2}$	Rye-grass, medic of late years
Belluno:			
Belluno	Limestone, green sandstone, marl, and conglomerates.	$\frac{1}{2}$	Medic, clover, rye-grass.
Agordo	Limestone, red sandstone, chalk, scaglia.	$\frac{1}{2}$	Rye-grass, clover, medic, native grasses.
Auronzo	Dolomite, arenaceous and calcareous schist, quartz porphyry.	.....	Pasture of Phlomis alpinum, agrostis, alopecurus, poa, festuca, avena schneebzin, &c.
Vicenza:			
Vicenza	Metamorphic lime and sand stone, dolomite and basalt tufa, gravel.	$\frac{1}{2}$	Clover, red and white, medic.
Asiago	Dolomite, red sandstone, chalk, basalt tufa.	.....	Insignificant, $\frac{1}{2}$ in mountain pastures.
Basano	Glacial detritus, tertiary limestone, basalt, tufa, chalk.	$\frac{1}{2}$	Medic, lucern, timothy, clover, vetches.
Verona:			
Verona	Numolite limestone, chalk, tufa, lignite, moraine.	.....	Medic and clover, mostly natural pasture.
Sanguinetto	San t limestone, conglomerates.	$\frac{1}{2}$	rich irrigated, medic, clover, sainfoin.
Padua:			
Padua	Sand, gravel, trachyte, limestone, and conglomerates.	$\frac{1}{2}$	Timothy, medic, clover, many native grasses, phlomis, poa, agrostis, many species of vetch.
Cittadella	Gravel, conglomerates	$\frac{1}{2}$	Do.
Piava	Alluvial, sand, clay, peat .....	.....	Lucern, medic, clover, vast bottom pasture.
Rovigo:			
Lendinara	Gravel, recent conglomerates, clay.	$\frac{1}{2}$	Medic, clover, insufficient for consumption.
Adria	Deep alluvial, sand, clay, peat alternating.	.....	Mixed with other crops, medic, clover.
Ariano	Delta; clay, gravel, peat .....	.....	Insignificant, mostly salt marsh.
Venice:			
San Dona	Delta; clay, argillaceous and cretaceous marl.	$\frac{1}{2}$	Very fertile, medic, clover, and bottom pasture.
Venice and Dolo	Sand, clay, marl, indurated clay.	.....	Little cultivation, waste pasture, bad water.
Chioggia	Gravel, clay, sand, peat		Insignificant, waste and bottom pasture.

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BELGIUM.

CATTLE IN BELGIUM.

REPORT BY CONSUL STEUART, OF ANTWERP.

In reply to the circular and memoranda calling for information relative to breeding cattle that would be of value to stock-breeders in the United States, I have to regret that my efforts, both by personal inquiry and by correspondence, to obtain some points of value bearing on the subject have been attended with indifferent results, some of my letters remaining unanswered.

Belgium offers no cattle for export, first, because the home demand is far in excess of the supply, and then because there is no race here sufficiently prominent or meritorious to attract the attention of the purchasers from the United States, who are almost always present in the neighboring kingdom of Holland seeking the valuable cattle in which that country is so rich.

From an official report published this year by the bureau of agriculture in the department of the interior at Brussels, we learn that for some years past the cattle in Belgium have shown great improvement, owing to the great care taken in the selection of the breeding stock brought into the country from England and Holland, and to the great attention paid to the offspring. They are well housed, carefully fed, and every care taken in order to produce the best results. The Durham bulls from England are the most valued and most in use, and the cross from this race are very successful, and becoming more and more numerous every year. In some places an effort has been made to preserve and breed the Durham stock pure, but the result was a failure. After two or three generations they degenerate so greatly that the infusion of new blood is necessary; thus, whilst the cross is a great success, the pure race will not thrive in this country.

The province of Antwerp prefers to improve her stock by the introduction of the Dutch race, because the dairy is the result aimed at, and but little attention paid to the other products. The cow is valued only by her milk-giving qualities, and for this purpose the Dutch are much the best.

In the province of Flanders the great proportion of the cattle are of the Cassel breed, or, as it is called in France and in all the markets, the Flemish breed. In many of the districts more than half the cows are of this breed, whilst in other districts the Durham is used to cross with the native cows, or with those brought in from Holland.

In the province of Brabant the Durham is held in the highest estimation, but in the weekly market held at Diest, which is a very important center for the cattle trade, the Holland cattle take a very important part.

As the home product falls far short of the demand for consumption, the Government has interested itself greatly, as it does in all matters affecting the material interests of the Kingdom, in order to secure the increase needed, and at the same time to improve the breed as much as possible. To this end an appropriation is made yearly and expended by agents appointed by the department of the interior for the purchase and importation of the best pure-blooded animals suitable for the purpose; the purchases are generally made from the Durham and Holland

stock, and these animals are distributed among the different provinces and sold to the stock-breeders. The result is carefully watched and rewards are offered to those who are able to show the best specimens arising from judicious care and attention.

Professor Leyder, of the Royal Agricultural Institute, sends me a pamphlet written by himself upon the animals at the national exposition of 1880, and in his written reply to my inquiries he says:

None of our races have sufficient merit to attract the attention of stock-breeders; also that our statistical documents are silent upon the subject of the distribution of cattle races among the different provinces.

In his pamphlet he states that the demands for home consumption, which the product is far from covering, call for large importations of cattle. Since a dozen years the excess of importations over exportations has been about 50,000 head yearly. Holland contributes most largely to this number, partly of cattle ready fattened for the market, of others coming to be fattened, and also of some reserved for breeding purposes. Of the 123,201, 121,138, and 142,480 head of cattle imported, respectively, in 1878, 1879, and 1880, there came from Holland 107,008, 106,933, and 113,808 head.

TRANSPORTATION OF CATTLE TO THE UNITED STATES.

Although Belgium has no cattle of her own to export for breeding purposes, she offers the best route of export from this part of the world to the United States. The White Cross line of steamers, sailing from Antwerp to New York, Boston, and Quebec, are fitted with the proper accommodations for the transport of cattle, and they carry a great many, principally coming from Holland, some from Switzerland, but more from Belgium. The cattle are brought to Antwerp by rail or water, are inspected by the veterinary surgeon, and then placed on board of the steamers.

COST OF TRANSPORTATION TO THE UNITED STATES.

The agents of the line here furnished me with the following as the rates of transportation, namely: £8 per head for cows, £7 per head for yearlings, £6 per head for calves, including installations, water, and feeding for twenty days. The men accompanying the cattle for attendance have free passage.

If no men accompany the cattle the steamer provides attendance at the rate of 4s. per head. If shippers provide feed the price is £2 less per head.

JOHN H. STEUART,
Consul.

UNITED STATES CONSULATE,
Antwerp, December 29, 1883.

BREEDS OF CATTLE IN BELGIUM.

REPORT BY CONSUL WILSON, OF BRUSSELS.

In a country where the subdivision of property is so great and the population so dense as in Belgium, the raising of stock and the improvement of breeds, of necessity, cannot constitute an important branch of agricultural industry; nevertheless, within the last few years there has been amongst agriculturists here a strong and persistent effort

made to improve the stock for the people. The result is now can be seen. The breeds are, however, not so well defined to the peculiar qualities of the

On the whole, the prevailing type is distinguished by a moderately bald color, and their dairy

Farther from the Arden quartz and been bred, the "Arden" This breed is of red color, subjecting forward always on the These are well-flavored of the herb

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These three of propriety crosses with from Cassel, Attracted English Shod, have at stock, but w sults; for the home of the to a degree this country,

made to improve all animals that either furnish beef or dairy products for the people; as a result of this effort, it is doubtful whether there now can be found any purely indigenous breeds in this country. There are, however, several distinct varieties bred here, each generally confined to a particular district of the country, characterized by some peculiar quality of pasturage, soil, or climatic condition.

THE FURNES-AMBACHT BREED.

On the rich plains and polders of East and West Flanders the prevailing type of cattle is that known as the "Furnes-Ambacht" breed, distinguished by handsome and well-proportioned forms, short legs, moderately large, crooked horns, and usually of a red and white piebald color. They are renowned for both the quantity and quality of their dairy products throughout the Kingdom.

THE ARDENNAISE BREED.

Farther east and west, on the slopes and valleys of the foot-hills of the Ardennes, where the soil chiefly consists of decomposed schist-quartz and affords a less abundant yet nutritious herbage, there has been bred, almost from time immemorial, another variety known as the "Ardennaise" stock.

This breed is characterized, when not crossed with any other, by its red color, small size, clean, smooth limbs, and long, sharp horns projecting forwards and surmounting a head carried well up, as though always on the alert against surprise or danger.

These animals are not usually good milkers, but produce rich and well-flavored meat, doubtless more or less resulting from the character of the herbage upon which they feed in this mountainous district.

THE CHARLEROI BREED.

In the Herve and Condroz districts, touching the German frontier on the northeast, there formerly existed a variety of cattle much resembling the Ardennaise, excepting that they were almost uniformly of a black and white piebald color; but within the last few years the introduction of the Shorthorns into these districts has greatly changed both their form and color, so that the pure Condroz race is now rapidly disappearing and the present stock of that region, known as the Charleroi breed, taking its place.

FOREIGN AND CROSS BREEDS IN BELGIUM.

These three varieties of cattle are all that can now, with any degree of propriety, be denominated native breeds, and of them and their crosses with the Shorthorn Durham, the Dutch Piebald, and a variety from Cassel, almost the entire herds of the country are the progeny.

Attracted by the rapid growth and splendid forms of the pure blood English Shorthorns, the farmers, in almost every district of this Kingdom, have attempted to cultivate them to the exclusion of their native stock, but with variable and by no means uniformly satisfactory results; for they overlooked the facts that the valley of the Tees, the true home of the Durham, abounds in rich pasturage and other cattle food to a degree greatly exceeding most of the cattle-growing districts of this country, and that the rapid growth and quick maturity of this

stock demands a proportionate amount of special care and nutritious food.

Many of the stock-growers of this country, after having spent large sums of money themselves, and having received handsome subsidies from the Government in experimenting with these cattle, have been forced to abandon them and fall back upon crosses with their native stock, as more hardy in constitution and better adapted to the food produce and climatic conditions of their districts. The crosses with this stock, however, are now found in every district in the Kingdom, and have to a large degree supplanted even the famous Dutch breed so long and highly esteemed here.

I may add here that the importance given in this country to any one variety over the others above mentioned, chiefly depends upon the kind of pasturage and other food the department where they are found produces, in connection with its peculiar agricultural interest.

In the province of Antwerp the production of milk and butter and the raising of vegetables for the London and Antwerp markets are found so much more profitable than the growing of beef cattle, that the farmers of that district will have nothing to do with any but such cattle as produce the largest amount of milk upon the smallest amount of food, and for this they prefer the pure Dutch cow or her crosses with the Flemish animal.

In the province of Brabant great efforts have been made to introduce the pure blood Shorthorn Durham, and for awhile it was thought that this stock would drive out all others, but the increasing demand for milk and butter in Brussels and its populous environs, with the profitable market they afford the farmer for his root and vegetable crops of various kinds have here, also, arrested the introduction of Durhams and to a large degree substituted for them the small, hardy Hollands and their crosses, which, under a more moderate quantity of truck food, yield a larger amount of rich milk and butter.

In the province of Hainaut all efforts to introduce the pure Durham have failed to succeed. In a report of the agricultural commission of this province now before me the commission says: "It is impossible to believe that the prejudices for old habits and routine is the sole cause of this result; we are therefore forced to believe that this so perfect breed of cattle neither suits our exigencies nor our wants, and that we must content ourselves with a cross with the native stock instead of the pure Durham."

This, I have no doubt, is the opinion of all stock-raisers in this province, for, with the exception of a few fancy breeders, the farmers of the entire province cling to the pure native or its cross.

In the province of Liege a number of pure blood Shorthorn bulls and cows of a variety celebrated for its milk and butter producing qualities have been recently imported from England, with satisfactory results thus far, and it is thought that this variety of exotics may yet be found better adapted to this district, both as a profitable animal for the shambles and as a good milker, than any other breed; but this I very much doubt from the conflicting testimony I receive.

The farmers of Limbourg and Luxembourg are more devoted to the raising of beef cattle for the markets of the country than to milkers, and in these provinces the Durham crossed with the native stock gives entire satisfaction.

The province of Namur, from its topographical features and the character of its soil, is chiefly adapted to pasturage and to the raising of beef cattle for the market, but the pure Durham, though in repa-

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CATTLE FEEDING IN BELGIUM.

Although, as before stated, Belgium is not to any considerable degree a cattle raising country, the amount of care and labor the small farmers and dairymen bestow upon these animals is very great, and as a result they have succeeded, in many cases, in bringing their milch cows up to the highest degree of milk and butter producing qualities.

Many of these cows are stall-fed all the year; plenty of good water and the food best adapted to the production of rich milk is supplied them with great punctuality. They are combed and brushed and their skin kept perfectly clean; their stables are also models of cleanliness, and nothing is left undone either in the way of kind treatment, abundant food and water, or good shelter, to bring these animals up to the highest degree of perfection. Their food from May to October consists chiefly of an abundant supply of clover; from October to January turnips and carrots boiled are added to the fodder, and from January to May beets, and malt when it can be had, are fed. Clover and malt are here regarded as the best milk-producing articles of food.

YIELD OF MILK OF BELGIAN COWS.

From the most reliable information I can obtain a good, average fresh Flemish cow will yield from 23 to 30 liters of milk daily; a Flemish and Ardennaise cross, from 18 to 24, and a pure Holland about the same quantity. All the crosses with the Shorthorns may be set down as giving a fraction less than these figures in quantity; as a rule their milk is richer in cream and consequently in butter, but after the separation of the cream the milk is left proportionately poor.

MISCELLANEOUS STATISTICS.

The cows of all the native breeds and crosses in this country are considered at maturity when three years old, but bulls and steers, particularly of Durham crosses, will grow until they are four years old.

In the subjoined table, marked A, will be found, as nearly as I can ascertain it (in the absence of any statistics on the subject), the live weight of these animals at three years old, and the average price paid per kilogram, live weight, for them fattened for the market. The table marked B, giving their size, is a transcript of that published here on the occasion of the great national exhibition of 1880, and is the only reliable information I have been able to obtain on this subject.

IMPORTS OF CATTLE INTO BELGIUM.

As no census of the horned cattle in this Kingdom has been made since 1875, I am unable to give a reliable answer to the questions in your circular as to the present number, the percentage of breeds, and the proportion bred for the butcher and dairy; but official documents furnished me show that the importation of cattle into Belgium in 1881 amounted to 121,000 head, whilst the exports only amounted to 42,911 head, thus showing a deficit in the home supply for that year of 78,089 head.

Of the total number imported Holland supplied 91,080, and the United States 355 head.

PRICES OF BELGIAN CATTLE.

There were sold in the markets and fairs of the country in 1881, 186,262 milch cows, at a mean price of 300 francs per head; 74,065 heifers, at a mean price of 185 francs; of steers, there were sold 71,014, averaging, per head, 360 francs; and of young bulls, 33,431, at a mean price of 165 francs.

BELGIAN CATTLE FOR THE UNITED STATES.

It will be necessarily inferred from the prices paid for the animals of these various classes in the open markets of the country that they could not have been of a superior quality, and indeed this is the fact with regard to all horned cattle bred in this country. So far as my own personal observation has served me, I am convinced that the farmers of the United States have nothing to learn from this country in the matter of selective breeding and the production of valuable stock either for the shambles or the dairy, and I do not hesitate to say that more fine bovine specimens of pure and crossed bloods may be seen in a day amongst the farmers of our Middle and Northwestern States than can be found within the entire limits of this country.

As before stated the small farmers and dairymen have lavished a great amount of care upon their milch cows, and thus secure from them a large daily yield of milk; but I doubt not that on every well-managed farm or dairy in the United States there can be found cows that in this quality will equal the best of this country.

Finally, as a result of my personal observation and all the information I have obtained from other sources, I am convinced that no importation of milch cows from this country could greatly improve our present stock, and as to beef cattle, I have seen in the fields and stables of the farmers of the United States, both Durhams and Devons, not only far surpassing anything found in this country, but equal to the finest herds bred in England, their native home. If, however, notwithstanding these facts, any of our farmers feel inclined to test the improvement expatriation will produce on any of the stock of this country, I would recommend the Flemish cow as possessing qualities capable of a larger and more immediate improvement than any other of the native breeds, and now that there is a fine line of steamers plying between New York and Antwerp the experiment need not necessarily be an expensive one.

THE EXPORT OF AMERICAN BEEF AND BEEF CATTLE TO BELGIUM.

Whilst, however, I do not believe our stock growers can derive much benefit from the importation of Belgian cattle, I am convinced that, with proper management, an enterprise for the exportation to this country direct, of both live cattle, beef, and mutton would pay a large profit. In the herewith inclosed table, marked C, I have given the selling price of meat in the markets of the principal cities of this country, which will serve as a basis of calculations from which the profits of such an enterprise may be calculated, and I cannot but think that with the now regularly plying steamers between Antwerp, New York, and Philadelphia, a large and profitable trade of this character could be secured.

UNITED STATES CONSULATE,
Brussels, November 9, 1883,

JNO. WILSON,
Consul.

Name of

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B.—Measure

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Bulls from one
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Cows:
Native or
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Dutch
Ardennaise
Heifers from the
Native or
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Dutch
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C.—Average

Antwerp
Brussels
Bruges
Ghent
Mons
Liege
Hasselt
Arion
Namur

A.—Average weight and price of three-year-old cattle in Belgium.

Name of breeds.	Live weight.			Price per kilogram.		
	Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
	Kilos.	Kilos.	Kilos.	Francs.	Francs.	Francs.
Flemish	550 to 600	600 to 700	600 to 800	0.88	0.95	1.05 to 1.15
Ardennaise	400 500	450 550	500 550	0.60	0.60	0.90 1.00
Dutch	500 600	550 650	600 700	1.00	0.90	1.00 1.10
Durham	550 650	650 750	600 800	1.00	0.90 to 0.95	1.00 1.10

Crosses with the Shorthorns have slightly increased the weight of all the native breeds above given, but, as will be seen, the Flemish ox commands the highest price per kilogram in the market.

B.—Measurement of cattle exhibited at Brussels in 1880, and which received premiums.

[In centimeters.]

Description.	Height.	Vertical depth of the breast.	Length of the head.	Height of hook.	Length of buttocks.	Length of whole body.
Bulls over three years:						
Native or crossed	144.2	81.7	58.5	55.5	62.7	188.7
Pure Durhams	145.2	84.0	58.3	53.6	62.0	181.7
Dutch	140.0	80.5	58.0	55.0	57.5	183.0
Ardennais or crossed	135.0	77.0	54.3	75.2	53.0	167.6
Bulls from one to three years:						
Native or crossed	138.0	78.0	55.0	45.0	58.0	170.0
Pure Durhams	141.0	78.3	55.6	54.3	62.0	178.0
Dutch	141.3	80.3	57.0	54.0	60.7	179.7
Ardennais or crossed	124.7	69.0	50.7	53.0	45.0	150.0
Cows:						
Native or crossed	141.5	77.0	56.0	54.5	59.2	180.5
Pure Durhams	138.0	78.3	52.1	53.1	59.7	172.7
Dutch	139.0	77.3	56.3	53.0	56.0	169.3
Ardennais or crossed	129.7	71.3	50.3	52.3	53.3	163.0
Heifers from two to three years:						
Native or crossed	134.4	72.3	50.6	54.0	54.3	165.0
Pure Durhams	130.3	74.8	49.0	49.3	53.3	163.3
Dutch	135.3	72.0	50.3	51.6	51.7	164.7
Ardennais or crossed	130.7	67.0	49.0	51.3	49.0	161.0

C.—Average price per kilogram of the whole carcass of animals killed and dressed for the markets in the principal cities of Belgium.

[In francs.]

	Ox.	Bulls.	Cows.	Veal.	Mut. ton.
Antwerp	1.62	1.39	1.49	2.00	1.82
Brussels	1.65	1.42	1.50	2.05	1.60
Bruges	1.80	1.40	1.70	2.00	2.00
Ghent	1.68	1.38	1.50	2.14	2.91
Mons	1.85	1.50	1.75	1.90	1.75
Liege	1.60	1.34	1.50	1.45	1.55
Hasselt	1.70	1.50	1.60	1.80	1.90
Arlon	1.60	1.30	1.60	1.20	1.80
Namur	1.82	1.59	1.70	1.77	1.81

CATTLE AND CATTLE BREEDING IN BELGIUM.*REPORT BY CONSUL TANNER, OF LIEGE.***DIFFICULTIES IN THE WAY OF SECURING CATTLE STATISTICS.**

I can appreciate the desire on the part of the Department to make an effort to elevate the standard of American cattle; and it would afford me pleasure of no ordinary degree should it be in my power to aid in this important matter. The inquiries contained in the cattle circular are far-reaching and very comprehensive. In a small country like Belgium, where at least three distinct languages are spoken, where weights and measures are so different from our own, one encounters difficulties (in ascertaining facts such as are sought for by the circular) of such a nature and from so many different quarters as to almost discourage one in pursuit of them from all efforts. Most farmers in this part of Belgium speak Valoonish, those near Antwerp or in the western part of Belgium speak Flemish, while the better classes speak French. The laboring classes not only cling tenaciously to their ancient language, but they manifest absolutely no interest in imitating what is called the higher class in speaking French. The consequence of this is that, as they must come in contact with the laboring classes, and as all the servants are from the Valoon class, the mountain must go to Mohammed, the better classes must know enough Valoon to speak and understand it. This being the case, I hope the efforts of the Department in a field so difficult to get at facts will be appreciated by our stock-raisers.

BELGIAN CATTLE BREEDS.

So far as the different breeds of cattle in Belgium are concerned they are as numerous as there are localities of different names, and there has not been that general and universal effort to retain purity of breed in Belgium, such as has been the case in England. There has been effort, however, to this end in a few cases of families of rank, who have been very particular about the pedigrees of their cattle, and therefore in this way there are several breeds that have retained their untarnished pedigrees most faithfully. The breeds to which I allude present now, in outward appearance and in results for both the dairy and for beef, cattle that cannot be surpassed in the world. This is more particularly true of the breeds known here as the *Hollandais* or Dutch cow and the *Flamande* or Belgian cow. There is a strong likeness between these two breeds that suggests unmistakably to a judge of cattle a common origin. Of this there is not a question in my mind. I will not take space to explain why I am so thoroughly convinced of this.

ASSUMED ORIGIN OF THE ENGLISH SHORTHORNS.

Professor Hengeveld, a Dutch authority of great repute on cattle, says that the Shorthorns of England had their origin from the cattle of North Holland in this way: "When William, Prince of Orange, was called to the British throne, he missed greatly the fine flavor and rich, creamy milk of his native land, and had a shipload of them imported from Holland to England, and from these sprang some of the now most famous breeds of cattle in England." If that is true, I am glad to call the attention of the Department to it, as it seems to answer one of the

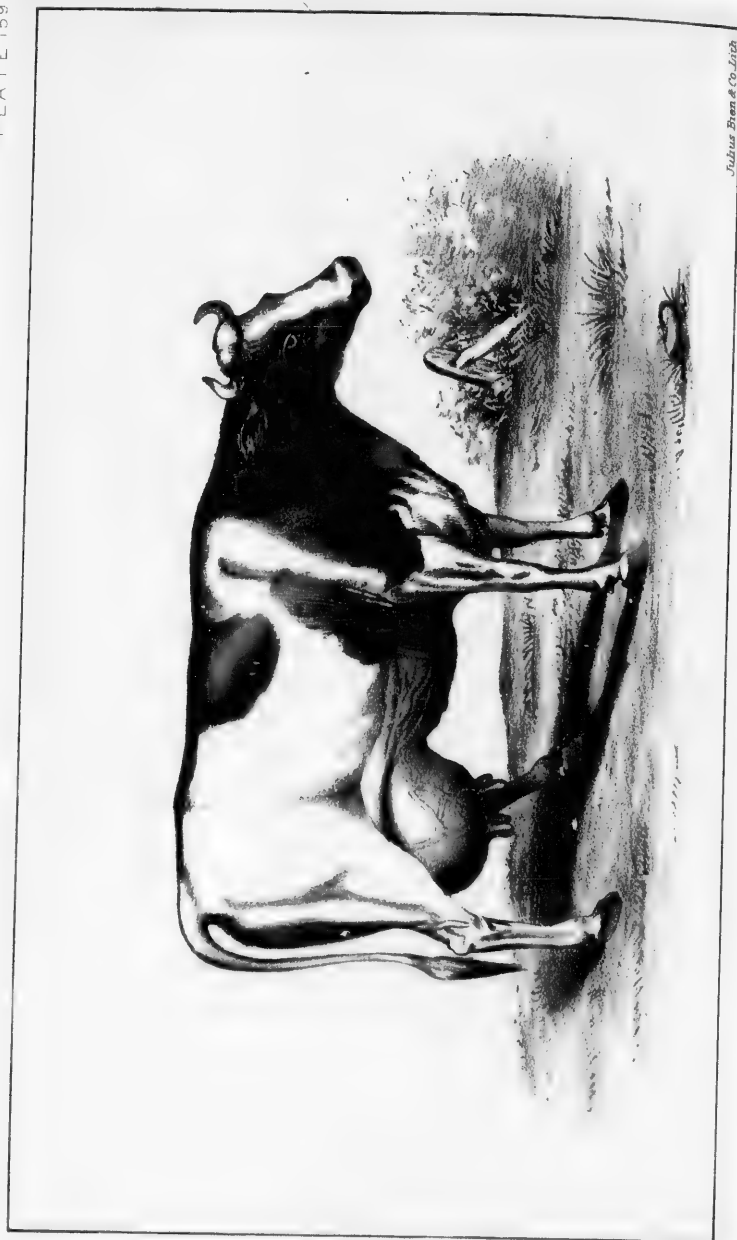
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inquiries of the cattle circular, as to whether the breed of cattle are improved by migration? as the Shorthorns which sprang from the Hollandais seem to thrive better in England, and seem to be greater favorites than any other breed of cattle in the world.

CATTLE CENSUS OF BELGIUM.

Statement showing the different breeds and number of cattle of different breeds in Belgium.

Name of breed.	Price per head (average), cow.	Height.	Depth of chest.		Length of body.		Circumference of body.	Length of neck.		Width across hips.	Average weight, cows.	Number of breed in Belgium.
			<i>Ft.</i>	<i>Inch.</i>	<i>Ft.</i>	<i>Inch.</i>		<i>Inch.</i>	<i>Inch.</i>			
Hollandais, Dutch, or Holsteins	\$118 to \$180		<i>Ft.</i>	<i>Inch.</i>	<i>Ft.</i>	<i>Inch.</i>						160,000
Flamand or Belgian, three types:												
Flandonnais	195	25 $\frac{1}{2}$	4 $\frac{1}{2}$	33.3	5 $\frac{1}{2}$	7 $\frac{3}{4}$	24	26.0	1,999			210,000
Bourbonnais	118	14 $\frac{1}{2}$	4 $\frac{1}{2}$	34	6 $\frac{1}{2}$	7 $\frac{3}{4}$	24	30 $\frac{1}{2}$	1,676			
Picardy	118	14 $\frac{1}{2}$	4 $\frac{1}{2}$	34	6 $\frac{1}{2}$	7 $\frac{3}{4}$	24	30 $\frac{1}{2}$	1,676			
Danois	110	135	4 $\frac{1}{2}$	30	5 $\frac{1}{2}$	7 $\frac{3}{4}$	23	25	1,650			80,000
Flechet	60	100	4 $\frac{1}{2}$	27.3	4 $\frac{1}{2}$	7 $\frac{3}{4}$	22	22 $\frac{1}{2}$	1,200			10,000
Charleroi	60	90	4 $\frac{1}{2}$	30.3	5 $\frac{1}{2}$	7 $\frac{3}{4}$	23	22 $\frac{1}{2}$	1,713			80,000
Contentine (Norman)	60	90	4 $\frac{1}{2}$	30.3	5 $\frac{1}{2}$	7 $\frac{3}{4}$	23	22 $\frac{1}{2}$	1,740			50,000
L'Oldenbourg	55	70	4 $\frac{1}{2}$	33.3	5 $\frac{1}{2}$	7 $\frac{3}{4}$	23	25.0	1,735			122,000
Durham	65	85	4 $\frac{1}{2}$	32.2	6 $\frac{1}{2}$	6 $\frac{1}{2}$	24	31 $\frac{1}{2}$	1,890			50,000
Ayrshire	65	85	4 $\frac{1}{2}$	30.2	5 $\frac{1}{2}$	6 $\frac{1}{2}$	24	29	1,300			15,000
Jerssey	60	75	4 $\frac{1}{2}$	28.1	4 $\frac{1}{2}$	6 $\frac{1}{2}$	22	22.0	1,200			10,000
All others												850,000
Total cattle in Belgium												1,556,000

THE FAVORITE BREEDS IN BELGIUM.

As before stated, there has not been that general effort in Belgium to retain purity of particular breeds which has been the rule in England. There are many distinctive breeds here, but this is more in consequence of the customs of the people, who care little for change. More effort has been bestowed on the perfection of the material on hand than in trying to accomplish such results from foreign stock. Each breed has its advocates as to its superiority, and if an equal assemblage of the representatives of all the breeds should meet to determine which was the best, it would be difficult to arrive at a decision. I believe, on the whole, that the contest would be reduced to three breeds, viz, the Flemish, the Dutch, and the Flechet. Between these three the contest would be very close, with many advantages in favor of the latter, the principal being the richness of the milk and the cheapness of the cattle.

THE HOLLANDAIS.

The Hollandais, or Dutch, cattle, on the whole, I think are generally more esteemed than any other, though the Flemish, which belong to the same family, hold almost equal rank. The two cuts below will represent, though in an unsatisfactory manner, the Holland cow as she exists in this section.

The color is black and white, but it often varies, as it does also in the Flemish, to a brindle-reddish or dun color, varied with spots of white.

THE FLEMISH COW.

The cut below will represent the Flemish cow with tolerable accuracy.

This breed of cows ranks almost equally with the Dutch, even in North Holland, and, in France, Germany, and Switzerland, are esteemed above any English breeds by all those who know cattle. That which this breed lacks in quantity of milk it makes up in quality, and that which it lacks in size for beef is compensated in the same way. These two breeds are as gentle and kind in disposition as it is possible for cattle to be. A child can walk up to them anywhere or at any time, and lead them or play around them, without any fear of harm.

THE FLECHET BREED.

The Flechet breed is a very remarkable breed of cattle. They are small, as will be seen by the table, and of a red and white color. The products of this breed are better known here than the breed itself. *Le beurre de Herve* (butter from Herve) brings in this market from 15 to 20 cents more per kilogram than that of any other butter, and milk and cheese from this breed of cattle are equally valuable. I am told that the King of the Belgians sends all the way from Brussels and draws his supply of butter and cheese from the dairymen of Herve. The home demand for the butter and cheese of Herve is greater than the supply at 15 to 20 and even 25 per cent. more per pound than any other cheese or butter, but for all this it finds its way through intermediaries into Brussels, Paris, Amsterdam, Berlin, Cologne, and Aix la Chapelle for the best restaurants and hotels. This breed of cattle shows perhaps more than any illustration that I could point to that the theory advocated by me in this dispatch is a good and rational one, and causes me to advocate it with the more confidence.

The farmers of Herve know absolutely nothing about the genealogy of this breed. They only know that the same cattle have grazed on the same pasture during the life of their fathers, or grandfathers, and that they yield good, rich milk, and that they must take good care of them. If you were to talk to them about pedigree you would not be understood; they have none—only that they are good cattle. They are not even known by name, and I have therefore taken it upon myself to name them after Chevalier F. Flechet, the well-known authority on agriculture, who has done and written so much and so ably for the agricultural interest of his section. Through the urbanity of Mr. Flechet I am enabled to send the photographs of this breed. I would take this occasion to offer a word of warning to Americans who may read that which I have said of this breed of cattle, and who may be desirous of possessing them, and that is, to profit here by their English experience, and if they buy do so quietly, so that the price will not be run up on them here as it has been by the shrewd cockney.

IMPORTS OF BUTTER INTO BELGIUM.

The percentage of cattle bred for the dairy in Belgium would reach 20 per cent. The remainder would go to the butcher and for breeding and draft purposes. Artificial butter is extensively used and manufactured in Belgium and is imported from Holland as well as the genuine article. The total importation of butter into this little kingdom amounted to nearly 9,000,000 kilograms for 1881, being, however, more

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by nearly 1,000,000 kilograms than for 1882 and most probably the same for the present year. The imports of butter into Belgium for 1882 was 7,842,000 kilograms, valued at 28,501,648 francs, the bulk of which went to Holland and France; to the former 13,697,299 francs, and to the latter 8,528,234.

IMPORTS OF MEAT AND MEAT CATTLE INTO BELGIUM.

The quantity of cattle or meat imported into Belgium for home consumption is hard to arrive at. The tables transmitted with the present for translation by the Department will be as near as can be ascertained. A vast amount of the imports of beef and cattle are merely in transit to some other country. The consumption of meat in Belgium is not so great as in England, because of the better compensation received by the English laborer, which enables him to supply his table more liberally. Few workmen in Belgium are there that taste meat (other than pork and horse flesh) more than once a year. Even the better classes do not consume beef in proportion to the same classes in the United States and England. During Lent and on Fridays Catholics do not eat meat, and, with five millions of people, that would make a vast difference in the annual consumption of an article. But for all this Belgium does not produce nearly one-half enough meat for home consumption. The tables inclosed will show the Department from what countries Belgium makes up her deficiency. That the United States takes such an insignificant part in the profits of this business is deplorable, and can come from nothing but lack of effort on our part. Every business man knows what is wanted to introduce and extend his business at home, and from that he must surely be able to draw conclusions as to what he must do to extend it beyond our borders. It would seem almost folly to repeat a thing so simple, viz: It is only to supply a good article cheaper than any one else can supply it and make it known to dealers in such articles abroad by samples or otherwise. Cheapness is the thing that goes further than anything else, and it is hard to hide a cheap article even if we want to hide it, and therefore it is very easy to make it known.

COUNTERFEITING AMERICAN PRODUCTS.

There are prejudices here now against our products which Americans at home can destroy by continuing to prove that they supply good and pure articles. They can in this way show to the people here that great rulers and their ministers can descend to misrepresentation for a purpose. I called personally on every important dealer here in American supplies and asked him to apprise me if at any time there should be any complaint against any American article that might pass through his hands. Only a few days elapsed before one sent me a note saying that he would like to have me call. I did so without loss of time. He said that there had been complaint about some American butter that the inspector had examined and pronounced it *mauvais* and *artificial*. I asked him if he had received the butter direct from the United States. "No," he said, "it came from a house I trade with in Maastricht." On looking at the firkin that contained the butter it had the name of a house in Newark, N. J., but I could see at a glance that the printing on the label had not been done in the United States. I summoned the inspector and insisted that the label be torn off, which was reluctantly done. Underneath the label was the Dutch brand that had been burned into the wood of the firkin,

showing that it came from Maastricht. The fraud was revealed at once, and I was relieved at once, because I knew that good butter is very difficult to keep fresh for any length of time, and that if the butter had been of American origin that the chances were that it was either artificial or that it was rancid. I mention this matter only to show the Department to what an extent we must fight against the unfair methods that are resorted to in order to create a prejudice against us. I am determined that these prejudices shall have no foundation in this consular district. If any American should, on the other hand, contribute towards these prejudices by importing an article that would have that tendency, I want to expose him at home.

AMERICAN PRODUCTS FOR BELGIAN CONSUMPTION.

We can supply meats, butter, eggs, poultry, &c., to the markets of Antwerp and Brussels cheaper than it can be supplied from France or Holland by 3 or 4 per cent. on the pound. I mention these two places because Antwerp is the entrepot for Belgium, and places in the interior generally supply themselves with foreign commodities from there, and hence it is to this place that the principal efforts for the introduction of American articles must be directed. It would be well to extend those efforts to Brussels, as a large surrounding area draws its deficiency in provisions from that city, and many merchants doubtless go there that do not go to Antwerp.

PRESERVATION OF MEATS AND VEGETABLES FRESH.

Dr. Clossett of this city has invented a means of preserving the freshness of meats and other provisions which may be of great service to our exporters in these articles. I have asked him for a statement of the merits of his process, which I herewith inclose. He has secured patents for this process both in Europe and America.*

GEO. C. TANNER,
Consul.

UNITED STATES CONSULATE,
Verviers and Liege, October 13, 1883.

BELGIAN AND DUTCH MILCH COWS.

REPORT BY CONSUL WILSON.†

Referring to my dispatch No. 17, September 15, and the fêtes given during the past summer upon the occasion of the semi-centennial anniversary of Belgian independence, wherein I described somewhat the commercial maritime history of Ghent, and the installation of the new basin and docks, I continue the subject by some descriptive comments

*The statement here referred to, concerning the preservation of fresh meat, and a valuable paper on farming in Belgium, also transmitted by Consul Tanner, will be found in the supplement.

†Consul Wilson, writing from Nantes, under date of December 17, 1883, represents that no material of any account on which to base a cattle report exists in that district, and refers to his report on the dairy exhibition at Ghent in 1881, which, being most apropos to this work on the cattle breeds of the world, is herewith republished from Consular Report No. 15. Some valuable tabulated statements, together with appropriate illustrations, not published before, are inserted in the report in its republished form.

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on the fête of the agricultural society of the province of Flandre Orientale held in this city, and which took the form of an exhibition of the milk industry of Belgium and Holland. It consisted of three grand divisions:

1. Milch cows, the producers.
2. Milk, butter, and cheese, the products.
3. The machinery and mechanical appliances used. These will be treated in inverse order.

DAIRY MACHINERY.

The machinery was interesting and accomplished its work well, but requires no elaborate mention, for the "universal Yankee nation" can be taught but little about machinery upon which is brought to bear, every day in the year, the inventive genius of every farm-yard, cheese factory, and creamery in the land.

One machine is worthy of description. It was the invention of Lefeldt, of Paris, for separating rapidly the milk and cream. It is a well-known fact that milk is heavier than cream. The usual method is by the application of the law of *gravitation* to this fact. The invention consists in the application of the law of *centrifugal motion*. The fresh milk is put in what resembles a common upright cylindrical milk can. The can is made to revolve, still upright, at a high speed. The milk, being the heaviest, flies to the periphery, which forces the cream to the center. They are thus separated instantly, and are drained off by means of flexible tubes—into one vessel the milk, into another the cream. The only care apparently necessary is to keep up the speed, and to properly gauge the quantity at the entry and exit.

Among the machinery exhibited was some for agriculture, and I was surprised to see the United States so well represented. Of lawn-mowers from Philadelphia, pumps from Seneca Falls, rakes, hoes, hay and dung forks, both from New York and Philadelphia, the United States had nearly a monopoly; and the importer, Dutry-Calson, said, for lightness, combined with strength and beauty of style, no other implements could successfully compete with ours. He said England, Germany, and Belgium could make them as *good*, but they were clumsier and heavier.

Here was another illustration, if one be needed, of the necessity for industrial art education among our mechanics. With an improvement approaching thoroughness in knowledge of the principles of art as applied to industry, the American mechanic can lead the world in the manufacture of articles for every day use, whether of necessity or luxury, and a demand will be created *for them*, which will be coextensive with the knowledge *of them*. This should be the ambition of every American mechanic, and when done, it will justly be the pride of the nation which gave him birth.

There were many sample wagons and carts for the delivery of milk to the customers, showing neat contrivances to insure its safety from adulteration by the carrier, but these have not yet come into general use. The commonest method of delivery in this country is shown by the following photograph, taken from nature.

BELGIAN MILCH COWS.

The second division, milk, butter, and cheese, will be reserved for another dispatch, if deemed of sufficient importance.

The first division, milch cows, would have been of great interest to American breeders and stock-raisers. I believe this subject can be studied with advantage and benefit to the people of both countries, and it is for this reason I deem it my duty to make this report.

An object to be desired by the cattle-breeders of the United States is an increase in the *size* of their beef cattle. This, I believe, can be materially aided by the importation of the large cows of the Holland and Flemish races and cross-breeding them with the cattle of the United States. I also believe this will be accompanied by an improvement in the milking qualities.

The outlay in time, trouble, expense, money invested, &c., is just about as much to raise a poor or small steer as a large one, while the recompense is increased as the weight increases. It needs neither illustration nor argument to prove the benefit.

The only question is its feasibility with sufficient benefit to compensate for outlay.

If the cattle-breeders of the United States could have seen the herd of cows at this exposition, as I did, they would have been impressed, as I was, by the great size of the cows and the desire to use them in the manner suggested.

There were 372 cattle entered for exhibition, nearly every one being milch cows, for the exhibition related exclusively to the milk industry.

The races represented were the Dutch or Holland cattle, the Belgian or Flemish cattle—both of pure blood—and some Durhams crossed with these. The first two are indigenous to their respective countries, very much alike, and doubtless sprang from the same stock. I am not sufficiently expert to give an opinion, but I believe them to be the same, or nearly the same, breed known in the United States as Holstein cattle.

Although these cattle may have no standing in the English and American herd-books as blooded cattle, I am constrained to believe it is rather a fault to be charged against the books than against the cattle, for it can be demonstrated that they have an ancestry many centuries old, from which, and through which, they have had a pure and unbroken descent, breeding in and in, without admixture or deterioration, preserving and perpetuating the characteristics and distinguishing marks of their race with a great certainty, definiteness, and exclusiveness as the best blood known. Motley speaks of them as noted nearly three hundred years ago for their size and general good qualities.

The agricultural society of the Netherlands has within a few years published a herd-book containing the pedigree of their cattle as far back as it can be traced. Their examination shows the existence of this, as a distinctive breed of cattle, in possession of this country as far back as the thirteenth century.

The color of the Belgian cattle is most frequently black and white, while the Hollanders are the same, but sometimes with a sprinkling of corn or tan color, something like that of the Alderneys. Sometimes this gets to be almost red, like the Durhams. But in both the dominant colors are black and white placed in large spots over the body; so also are the other colors, though smaller and sometimes running off into flecks. Their colors are somewhat known by the celebrated paintings of Paul Potter, of Amsterdam, made in the seventeenth century.

A tolerably correct idea can be obtained of a Holland or Belgian cow from the accompanying photograph; not taken for, nor presented as an entirely correct representation, but the nearest I could easily procure.

The landscape illustration herewith gives a better idea of these cattle; and when the traveler by rail or canal looking down, as he does,



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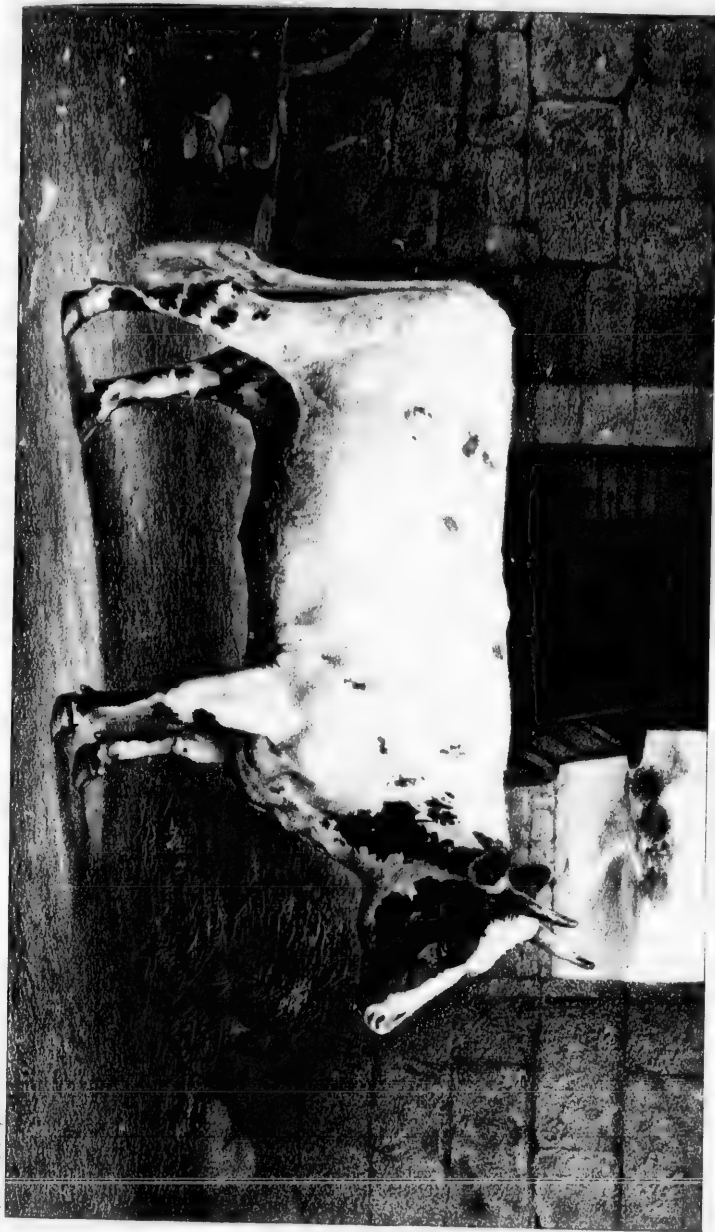
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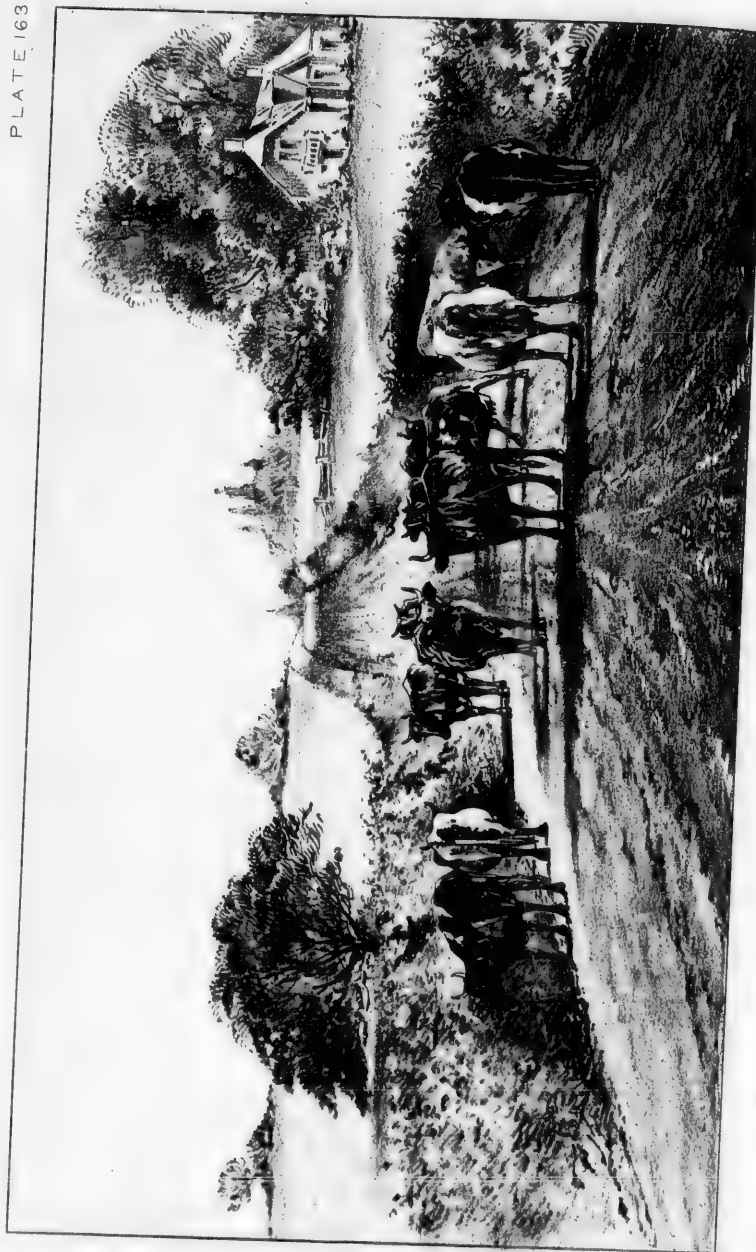
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on the low level lands of these countries, beholds a landscape, broad and deep, of rich green meadow, set in a frame of distant timber, each field bounded by one, sometimes two, rows of tall sentinel trees which look like a skirmish line, farm houses and barns with red-tile roofs, wind-mills throwing their giant arms about, apparently proud of their strength, while dotted over the grass, lighting up the scene with their large black and white spots, as something to attract and rest the eye, are to be seen, some standing, some browsing, some lying down, all quietly chewing their cud, a thousand of these cattle, immense in their size, with their sleek smooth coats, he says, "This is a land of richness; here are the evidences of prosperity."

SIZE AND WEIGHT OF BELGIAN CATTLE.

I give in tabular form the size of these cattle, and I ask any breeder or farmer to compare these sizes by measurement with his own cattle, and see if my conclusions are not correct.

Description.	Height.		Depth of chest.		Length of body.		Circumference of body.		Length of neck.		Width across hips.		Average weight.	Average price.
	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	In.	In.	Lbs.	
Flemish or Belgian bulls	4	8½	32	2	6	2	7	8.5	24	8	23	2	2,200	\$120 to \$140
Flemish or Belgian cows	4	7½	33	3	5	10.0	7	1.8	23	2	34	8	1,650	200 240
Holland three-year-old bulls	4	7½	31	5	6	0.8	7	4.5	22	6	23	6	1,875	100 120
Holland three-year-old cows	4	6½	30	3	5	6.5	6	10.2	22	2	23	2	1,450	100 200

It must not be understood that these figures represent the size, weight, or price of all Belgian or Holland cattle as they might stand in a herd; neither do they represent the exceptionally large ones. They are obtained by taking the average of the prime first-class cattle as they have been exhibited at the various exhibitions in Belgium.

The following table represents another class of cattle, those for beef or milk, not the finest, choicest cattle, such as are described in the foregoing table, but such first-class, prime cattle as can be bought in market every day, giving the average for each item. It gives the weights, both alive and dressed, the prices per pound for each, the percentage of clean beef after slaughtering, and the price of each animal:

Description.	Weight, alive.	Weight, dressed.	Percentage after slaughtering.	Price per pound, alive.	Price per pound, dressed.	Price per animal.
Beef, three years and over:	Pounds.	Pounds.		Cents.	Cents.	
Oxen	1,325 to 1,540	750 to 1,000	\$56 to 60	8½ to 9½	14 to 15	\$125 to \$150
Cows	1,200 to 1,450	600 to 825	\$60 to 65	9 to 10½	15	80 120
Cows for milk	1,200 to 1,450		53 to 57	8 to 9		80 120
Heifers, two to three years.	1,100 to 1,250					60 80
Yearlings						\$ 30 40
						50 60

MILKING QUALITIES OF BELGIAN COWS.

I might content myself with giving results, but many farmers and dairymen would desire the formula, may be for their satisfaction, may be for their use.

The cows were divided, by numbers, into groups, and one or more members of the jury assigned to each group, so as to give his personal attendance and supervision whenever anything was to be done.

The exhibition lasted four days. At six o'clock of the evening of the third day, at a given signal, each cow was milked clean and dry, preparatory to the test of the morrow.

The hours for milking were first fixed for 6 o'clock a. m., 12 m., and 6 p. m., but some complaints were made that the cows would not be able to hold their milk for twelve hours, and the first milking was advanced to 4 o'clock a. m. Every owner provided his own milkers, with whom his cows were acquainted.

The milk being taken from the cows was weighed, not measured, this being considered more accurate—each one separate, of course—and after being thoroughly stirred, samples were taken for tests of cream and for specific gravity, and the rest returned to the owner for his use.

The samples for cream were then examined, each one being made the same quantity and height in the glass, and being immersed to the neck in a large pan of ice-cold water, were set aside for the cream to rise. All samples were subjected to exactly the same treatment under the same conditions.

Many methods and machines, scientific and otherwise, for determining the quantity of cream were considered, but none were believed to be so fair and equal as this.

Such was the treatment after each milking, and at every step an accurate record was made by the member of the jury in charge.

The specific gravity was taken at 15° centigrade, 58½° Fahrenheit. The samples for cream were allowed to remain until the next morning at 9 o'clock; so the duration of their stay was twenty-six, eighteen, and twelve hours, respectively. The water in the pan then marked 12 C., 53 F.

The samples being taken out, the height of the cream was accurately measured and weighed, and all recorded on blank forms prepared for the purpose. The result will be given further on. (See Table No. 3.)

Butter is the principal product from within this province, and therefore the interesting question was, which cow's milk would have the most cream and consequently be the richest in its butter-making qualities.

The amount of milk and of cream given by each cow for one day being determined, that would determine the relative value of the cows in these regards *on that day*. But these cows may have been giving milk for different periods; one cow calved one month, and another six months previous; then the conditions will have been so changed that the amount of milk or cream given on that day is no true test. And this change of condition is inevitable unless all the cows could be induced to calve on the same day. As this could not probably be done, and would not be desired if it could, some arrangement must be made by which this difference can be equalized.

This was done by the adoption of a table of experiments and tests, made and prepared during the past two years by Mr. Tisdall, of the Holland Park and Horton dairy farms in England, at the request of the Dairy Association of Great Britain, and used at this great exhibition in 1880. (Agricultural Gazette, February 21, 1881. Table No. 1.)



A FLEMISH MILKMAID



A BRABANT MILKMAID





AN ANTWERP MILKMAID



Julius Hen. & Co. Lith.

A DUTCH MILKMAID

Number.

Name.

1	Victoria
2	dairy
3	Primrose
4	Jones
5	Shortleg
6	Hereford
7	Red Che
8	Paxon
9	Champion
10	Barry
11	Dasher
12	Cowallp
13	Charmer
14	Jones
15	Grenade
16	Looseley
17	Cockhorn
18	Sandwich
19	Meadow
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21	penham
22	Hereford
23	Blossom
24	Widney
25	Cherry
26	Hereford
27	Tiphorn
28	Hereford
29	Noble
30	Fair Maid
31	at Croy
32	Primrose
33	Darling
34	Lily
35	Champion
36	Droophorn
37	Lady
38	Brile
39	Pessant
40	Pearl 10
41	Henrietta
42	Cornish
43	Shortlegs
44	Minnie
45	Infanta
46	Bailey
47	Ariel, 3
48	Venus, 3
49	Sandy
50	Brindle
51	Brownie
52	Moreton
53	Cherrywhi
54	Ruby
55	Venus, 2
56	Minkin
57	Betts
58	Star
59	Dumpling
60	Infant
61	Charmer (H
62	Islington
63	Stoppa
64	Stag
65	Fancy

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TABLE No. 1.—Milk given by sixty English cows during twelve months.
[In quarts.]

Number.	Names of cows.	First month.	Second month.	Third month.	Fourth month.	Fifth month.	Sixth month.	Seventh month.	Eighth month.	Ninth month.	Tenth month.	Eleventh month.	Twelfth month.	Average for the twelve months.	Number of milk months.
1	Victoria (second prize, dairy show, 1878).	18.5	14.5	11.0	11.0	9.5	8.0	7.5	7.0	6.0	5.5	5.0	2.5	8.83	12
2	Primrose.....	18.5	10.0	17.0	13.0	11.5	11.5	9.5	8.5	8.5	8.5	6.0	7.0	11.54	13
3	Jones.....	18.0	20.0	10.0	14.0	11.0	11.0	8.5	4.5	.....	.....	.....	.....	12.67	8
4	Shortlegs.....	16.0	16.0	14.0	14.0	12.5	9.0	9.0	7.5	5.0	2.0	.....	.....	10.3	10
5	Hereford.....	17.0	17.0	14.0	13.0	11.5	14.0	11.0	9.0	7.0	3.0	2.0	.....	10.68	11
6	Red Cheek.....	16.5	15.5	14.0	13.0	12.5	11.0	12.0	10.0	8.0	3.5	1.0	.....	10.63	11
7	Paxon.....	16.5	14.5	12.5	12.0	8.0	9.0	7.0	6.0	6.0	.....	.....	.....	10.38	9
8	Champion.....	19.0	13.5	14.5	12.0	11.0	10.0	11.5	10.5	8.0	8.0	7.5	6.0	9.0	10
9	Barry.....	14.5	16.5	12.5	13.0	12.5	12.0	12.0	9.5	8.5	8.0	7.5	7.0	9.0	10
10	Dasher.....	18.0	15.0	13.0	11.5	10.5	9.5	9.0	3.5	1.0	.....	.....	.....	10.55	9
11	Cowslip.....	16.5	14.5	15.0	13.0	12.5	10.0	10.0	9.0	8.5	8.5	7.0	6.0	10.66	10
12	Charmer.....	21.0	16.5	16.0	15.0	15.0	11.0	10.5	9.0	7.5	7.0	7.5	6.0	10.66	10
13	Jones.....	18.5	16.5	15.0	13.5	12.0	11.0	10.5	9.0	7.0	6.5	6.0	5.5	9.77	9
14	Grande, 5.....	19.5	17.5	14.0	11.0	9.0	10.5	8.5	8.0	6.0	2.0	.....	.....	10.18	11
15	Looseley.....	17.0	10.0	17.0	14.5	13.0	13.0	12.0	11.5	8.0	10.0	9.0	7.0	12.15	13
16	Cockhorn.....	18.0	18.0	14.0	12.0	10.5	10.5	9.0	8.5	7.5	6.5	6.5	5.0	10.15	13
17	Sandwich.....	18.0	18.0	14.0	12.0	10.5	10.5	9.0	8.5	7.5	6.5	6.5	5.0	11.86	11
18	Meadow Flower, 14 (first prize at Chippenham).	19.0	20.0	18.0	15.5	13.5	13.5	11.0	9.0	7.5	6.5	2.0	.....	12.04	9
19	Hereford (Cox's).....	20.0	17.5	17.5	14.5	14.0	12.5	9.5	8.0	3.0	.....	.....	.....	13.83	10
20	Blossom.....	18.0	22.0	19.0	17.0	16.0	13.0	12.0	9.0	9.5	8.0	7.0	5.5	11.8	10
21	Widney.....	19.0	17.0	17.0	14.0	12.0	10.0	10.0	5.0	6.5	1.5	.....	.....	12.8	10
22	Cherry.....	20.0	19.5	18.0	16.0	13.0	11.5	14.0	8.0	4.0	4.0	.....	.....	14.01	9
23	Hereford (Cornish's).....	20.5	19.0	18.0	18.0	15.5	13.0	11.5	10.0	6.0	.....	.....	.....	10.36	11
24	Tiphorn.....	16.0	14.0	13.0	12.0	11.5	11.0	9.5	7.5	7.0	7.0	5.5	.....	15.0	11
25	Hereford (old).....	23.0	22.0	22.0	18.0	16.5	16.0	11.0	12.5	12.0	8.0	4.0	.....	13.39	9
26	Noble.....	17.0	16.5	17.5	15.0	14.0	12.5	10.5	8.5	8.5	.....	.....	.....	10.04	11
27	Fair Maid (second prize at Croydon, 1880).	17.0	10.0	13.0	11.0	9.5	10.0	7.5	8.5	7.5	6.5	4.0	.....	14.71	7
28	Primrose.....	19.5	18.5	17.5	16.5	14.5	12.5	4.5	10.5	8.5	11.5	0.0	0.0	12.04	12
29	Darling.....	17.0	16.0	15.0	12.5	12.5	13.5	12.5	10.5	8.5	11.5	0.0	0.0	10.56	15
30	Lily.....	17.0	10.0	15.0	12.0	10.5	10.0	10.5	12.5	10.0	10.0	0.5	0.5	14.4	10
31	Champion.....	20.0	19.0	17.0	15.5	14.5	14.0	12.5	9.5	8.5	.....	.....	.....	13.0	7
32	Droophorn.....	17.5	16.5	15.0	15.0	13.5	13.5	10.0	7.0	.....	.....	.....	.....	11.56	8
33	Lady.....	17.0	15.5	13.0	10.5	10.5	10.5	8.5	7.0	.....	.....	.....	.....	13.09	11
34	Brule.....	18.0	19.0	18.0	12.0	13.5	13.5	12.5	10.5	10.0	9.5	7.5	.....	13.20	12
35	Peasant.....	18.0	16.0	16.5	15.5	15.0	14.5	12.5	14.5	11.5	10.5	9.0	.....	10.0	9
36	Pearl, 10.....	16.5	13.5	12.5	12.0	11.5	8.5	7.5	7.5	6.5	6.5	.....	.....	14.68	8
37	Henrietta, 17.....	16.0	13.0	12.0	12.0	10.0	8.5	8.5	5.5	4.5	.....	.....	.....	12.1	10
38	Cornish.....	20.0	20.0	17.0	14.5	15.0	11.5	9.5	10.0	.....	.....	.....	.....	10.00	10
39	Shortlegs.....	22.0	21.5	21.5	15.5	8.5	6.5	8.0	7.0	6.0	4.5	.....	.....	10.00	10
40	Minnie.....	18.0	17.0	15.0	14.0	13.5	13.5	12.0	9.5	9.0	8.5	8.0	.....	12.0	10
41	Infanta.....	20.0	21.0	18.0	14.0	13.0	8.5	7.5	7.0	6.0	5.0	.....	.....	13.65	10
42	Bailey.....	19.0	16.0	10.5	18.0	17.0	15.0	11.0	10.5	8.0	5.0	.....	.....	8.35	11
43	Ariel, 3.....	15.5	12.5	11.5	10.5	7.5	7.0	7.0	6.5	5.5	5.0	.....	.....	11.04	11
44	Venus, 3.....	17.5	16.0	14.0	11.5	10.5	10.5	9.5	9.5	8.5	6.5	4.5	.....	10.04	11
45	Sandy.....	14.5	15.5	12.5	12.0	11.5	11.0	9.0	8.0	7.5	5.5	2.5	.....	8.88	9
46	Brindle.....	16.0	13.5	10.5	9.5	9.0	7.5	5.5	4.5	4.0	.....	.....	.....	9.36	11
47	Brownie.....	16.5	15.5	13.5	13.5	10.5	8.5	7.0	6.0	5.5	4.0	2.5	.....	11.37	8
48	Moreton.....	17.5	16.0	14.0	11.5	11.0	9.0	10.0	7.0	5.0	.....	.....	.....	10.37	12
49	Cherrywhite.....	18.0	17.5	15.0	14.5	14.0	11.0	10.0	7.0	5.5	5.5	4.0	.....	11.57	7
50	Italy.....	15.5	15.5	13.5	11.0	10.5	9.5	5.5	.....	.....	.....	.....	.....	10.0	10
51	Venus, 2.....	19.0	17.0	15.0	15.0	14.0	12.5	10.5	9.5	8.0	2.5	.....	.....	11.0	9
52	Minikin.....	19.0	15.5	12.5	12.0	12.0	12.0	10.0	5.5	1.0	.....	.....	.....	11.2	10
53	Idots.....	16.0	15.5	13.5	13.0	12.0	11.0	9.5	8.0	7.0	6.5	.....	.....	12.65	10
54	Star.....	16.0	14.5	12.0	13.0	12.0	9.5	6.5	3.0	.....	.....	.....	.....	13.31	11
55	Dumpling.....	19.0	18.0	15.0	14.0	14.5	13.0	10.0	7.5	6.5	3.0	.....	.....	17.0	13
56	Infant.....	25.5	17.5	17.5	15.5	13.5	12.5	11.0	11.0	11.0	7.5	7.0	.....	11.06	8
57	Charmer (first prize at Ilington, 1879).	20.0	25.0	23.0	23.5	20.5	20.5	14.0	12.0	12.0	11.0	12.5	8.0	14.14	14
58	Stops.....	17.0	16.5	14.0	12.0	10.5	9.5	5.5	3.5	.....	.....	.....	.....	10.92	14
59	Star.....	21.0	22.0	22.0	22.0	20.0	17.5	15.5	12.5	10.0	8.5	7.0	7.5	10.92	14
60	Fancy.....	19.0	18.0	15.0	15.0	15.5	12.0	11.0	9.0	8.0	6.5	8.5	5.5	10.92	14
Average for sixty cows.		18.07	17.09	15.03	13.75	12.58	11.34	9.72	7.94	6.01	4.67	3.05	1.85	11.5	10.83

If the cow, at the time of calving, gives milk to be represented by 100, she will give—

In the second month.....	5.424 less.
In the third month.....	10.823 less.
In the fourth month.....	23.907 less.
In the fifth month.....	39.548 less.
In the sixth month.....	37.285 less.
In the seventh month.....	40.209 less.
In the eighth month.....	58.060 less.

Example.—A cow gives an average of 20 quarts per day in the second month after calving. How much did she give at the time of calving?

Represent the amount or quantity she gave by 100, and we find by the table that she now gives an average of 5.424 per cent. *less*. $100 - 424 = 94.576 =$ the percentage she now gives, $\frac{100}{94.576} = 1.0573$.

In order to facilitate the work and to render it more accurate, giving the coefficients not only by months but by weeks, the following table was prepared by Monsieur Coilpo:

TABLE No. 2.

Description.	First month.	Second month.	Third month.	Fourth month.	Fifth month.	Sixth month.	Seventh month.
One to seven days.....	1.0090	1.0373	1.2924	1.3142	1.4398	1.5935	1.8591
Seven to fifteen days.....	1.0137	1.0902	1.2284	1.3435	1.4754	1.6525	1.9482
Fifteen to twenty-two days...	1.0270	1.1251	1.2538	1.3741	1.5128	1.7160	2.0465
Twenty-two to thirty days...	1.0428	1.1624	1.2843	1.4062	1.5521	1.7847	2.1551

Example.—A cow having calved five months and twelve days ago, gives now 8.75 quarts per day. How much did she give at the time of calving?

She is in the sixth month of her lactation. Seek the intersection of the perpendicular column of that month, and the horizontal line of "seven to fifteen days," and we find the coefficient 1.6525; that is, she gave at the time of calving 1.6525 more milk than she does at the end of five months and twelve days. Multiply the coefficient 1.6525 by the amount of milk she now gives, 8.75 quarts, another answer will be what she gave at the time of calving in $8.75 \times 1.6525 = 14.46$ quarts, the answer.

These tables do not pretend to mathematical correctness—that cannot be attained by any table or formula. They only pretend to give from the test of experience the probable rate of decrease or "taper" which may be expected in the milk-giving qualities of cows.

When the calculation is sought to cover a long period of milking, like ten or twelve months, it becomes uncertain. The jury did not apply it for a greater period than seven months.

I now give the result of the competitive examination, being the table presented by the jury.

I have continued the weight in kilograms and the measure in liters. The law of the United States has legalized the metric system and allows it to be used (Rev. Stat., sec. 3570). A kilogram is equivalent to 2.2046 pounds avoirdupois, and 1 liter is equivalent to 1.0567 quarts. Roughly stated, a kilogram is 2 pounds, and a quart and a liter may be taken as synonymous. Any one interested can easily make the calculation to his own satisfaction.

Twenty-two of these cows in the table gave over 20 liters, twelve gave over 24 liters, three gave over 28, two over 30, while one gave 34.3 liters, or over 8 gallons of milk, as her daily yield. Twenty gave over 2 liters of cream, five gave over 3, while one gave 4.7 liters.

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Calculating by the table aforesaid, the jury decided the amount of cream given by the eight highest at the time of calving to be as follows, and awarded the prizes accordingly:

Number.	Liters of cream at calving.	No. of prize.	Description and amount of prize.
23.....	6, 113	1	Gold medal and 250 francs.
62.....	5, 554	2	Silver medal and 225 francs.
67.....	4, 934	3	Bronze medal and 200 francs.
74.....	4, 442	4	Bronze medal and 175 francs.
68.....	4, 100	5	Bronze medal and 150 francs.
52.....	4, 148	6	Bronze medal and 125 francs.
30.....	4, 132	7	Bronze medal and 100 francs.
22.....	3, 682	8	Bronze medal and 75 francs.

Some of these cows had calved more than seven months previous, and the rule was not applied to them, but special prizes were given. Six cows from eight to nine months previous; four cows from ten to eleven months previous; four cows from thirteen to fourteen months previous; three cows from seventeen to twenty-two months previous. One of them had calved more than twenty-two months previous, yet she gave as her daily yield 20 546 liters of milk, from which was taken 1.36 liters of cream. The jury awarded her a prize, as they say, "for her remarkable persistence."

It must not be supposed these were the only cows tested, or that these were the only prizes awarded. Subdivision or groups were made according to residence of owner, age of heifer, &c., and this of which I have been speaking is only the report of the jury on milk or cream. There were several others. The milk of some cows contained three times as much cream as others. One gave 15.80 per cent. of cream, while another gave but 4.74 per cent.

In the majority of cases the morning milk was superior to that of the midday or evening.

The specific gravity varied between 1,026.3 and 1,038. Of the one hundred and sixty-eight samples of milk tested for specific gravity, twenty-five fell below 1,029.

TABLE No. 3.—Showing quantity and quality of milk of cows of the Dutch and Flemish breeds and their crosses.

Number of cows.	Proprietors.	Time of calving to day of test, July 12, 1881.	Hour of milking.	Weight of milk (in kilos.).	Density of milk at 55° F.	Product of each milking (in liters).	Volume of cream in product of each milking (in liters).	Amount per cent. of cream in the three milkings when taken together.	Volume of cream according to Table III, multiplied by the coefficient from Table III with which to multiply totals in column 7.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
1	J. Talboom, of Haesdonck.	Mos. Dys. 10 4	Morning .. 8.800 Noon 5.025 Night 5.100 Total	1030.0 20.5 28.9	8.544 0.700 0.576 1.865	0.700 0.576 0.580	0.68		
4	L. Van Peteghem, of Saffelare.	5	Morning .. 5.545 Noon 3.630 Night 3.170 Total	28.4 28.3 28.9	5.392 0.000 0.399 1.350	0.000 0.399 0.348	8.85	2.101	1.5975
5	J. Piers de Ravenschot, of Olsene.	1 13	Morning .. 10.350 Noon 7.735 Night 7.130 Total	31.7 31.4 20.5	10.032 0.803 0.750 2.433	0.803 0.750 0.880	9.04	2.632	1.0902
7	J. Vereenkeren, of Hensden. ¹	5 2	Morning .. 11.320 Noon 7.900 Night 0.500 Total	32.5 31.4 30.0	10.961 0.800 0.606 2.433	0.800 0.606 0.534	8.08	3.219	1.5335
8	J. F. Schollier, of Leerne St. Martin.	9 23	Morning .. 4.540 Noon 3.375 Night 2.815 Total	30.1 30.3 20.5	4.407 0.573 2.734 1.345	0.573 0.436 0.336	12.91		
9	do	9 2	Morning .. 5.700 Noon 3.790 Night 3.105 Total	27.7 28.9 28.3	5.005 0.729 0.368 1.414	0.729 0.368 0.317	11.43		
10	A. Claus, of Meirelbeke...	1 26	Morning .. 6.620 Noon 5.095 Night 4.105 Total	31.9 31.1 31.4	6.415 0.513 0.361 1.220	0.513 0.361 0.346	7.95	1.418	1.1024
11	F. Tollens, of Lovendeghem.	4 20	Morning .. 6.832 Noon 7.100 Night 5.350 Total	31.0 30.0 30.0	6.623 0.510 5.194 1.828	0.510 0.710 0.608	9.77	2.837	1.5321
16	J. Van Haelst, of Water-vliet.	3 1	Morning .. 12.020 Noon 9.040 Night 7.560 Total	33.0 30.3 30.1	11.636 0.892 9.873 2.475	0.892 0.873 0.710	8.73	3.170	1.2843
17	L. Van Ongeval, of Steenhuis-Winhuizen.	(1)	Morning .. 8.360 Noon 5.820 Night 4.445 Total	30.7 30.0 30.0	8.111 0.865 5.630 2.156	0.865 0.716 0.575	11.92		
22	C. Bouckaert, of Lootenhulle. ²	5	Morning .. 7.620 Noon 5.290 Night 3.670 Total	32.2 31.1 31.4	7.382 1.058 0.804 10.074	1.058 0.804 0.510	14.75	3.682	1.5321

¹ Honorable mention.² Eighth prize.

Number of cows.

F. Van Hoogen.¹

Ch. De Mu...

R. Vanhoogen-lare.

F. Martens.

J. De Sloo-neecken.²

Ch. Neyt, of

do³

B. Veyt, of V

C. Devos, of Z

Aug. Van Lo-bergen.

J. Vergauwen, Waa.

¹ First prize.

TABLE No. 3.—Showing quantity and quality of milk &c.—Continued.

and Flemish

when taken together.	Volume of cream according to Table III at the time of calving (in liters).	Coefficient from Table III to be added to multiply totals in column 7.	Number of cows.	Proprietors.	Time of calving to day of test, July 12, 1881.	Hour of milking.	Weight of milk (in kilos).	Density of milk at 51° F.	Product of each milking (in liters).	Volume of cream in product of each milking (in liters).	Amount per cent. of cream in the three milkings when taken together.	Volume of cream according to Table III at the time of calving (in liters).	Coefficient from Table III to be added to multiply totals in column 7.
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
				(1)	Mos. Dns.	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
				23 F. Van Hecke, of Baegem. ¹	0 17	Morning ..	11.020	30.1	10.698	1.391			
						Noon	7.730	29.5	7.508	0.976			
						Night	6.175	29.2	6.060	0.620			
						Total			24.266	2.987	12.34	6.113	2.0465
				24 Ch. De Mul, of Sinay	8 27	Morning ..	10.490	29.3	10.191	0.815			
						Noon	6.930	29.2	6.733	0.679			
						Night	6.805	28.9	6.613	0.800			
						Total			23.537	2.705	10.64		
				25 R. Vanhoorzele, of Saffelare.	4 27	Morning ..	5.690	31.5	4.934	0.296			
						Noon	3.570	30.3	3.465	0.219			
						Night	2.925	31.1	2.836	0.161			
						Total			11.235	0.676	6.01		
				26 F. Martens, of La Pinto ..	8 30	Morning ..	4.920	31.6	4.769	0.362			
						Noon	4.385	30.0	4.257	0.411			
						Night	3.322	29.5	3.226	0.290			
						Total			12.252	1.063	8.18		
				27 J. De Sloovere, of Sevennecken. ²	3 21	Morning ..	8.680	28.0	8.429	1.378			
						Noon	5.147	30.3	4.905	0.682			
						Night	4.237	29.5	4.115	0.450			
						Total			17.549	2.499	14.24	3.435	1.3741
				28 Ch. Neyt, of Sleidingo.....	8 2	Morning ..	5.150	26.0	5.010	0.709			
						Noon	4.263	27.0	4.152	0.526			
						Night	3.880	27.3	3.777	0.555			
						Total			12.945	1.783	13.77		
				30 .....do ³	4 27	Morning ..	10.200	29.5	9.907	1.690			
						Noon	7.557	28.0	7.351	0.955			
						Night	5.600	27.3	4.857	0.617			
						Total			22.125	2.662	12.03	4.132	1.5521
				31 B. Veyt, of Waerschoot...	2 4	Morning ..	10.820	33.6	10.468	0.529			
						Noon	8.142	30.6	7.902	0.395			
						Night	6.402	30.0	6.211	0.248			
						Total			24.581	1.166	4.74	1.465	1.2023
				32 C. Devos, of Zwynaerde ..	(*)	Morning ..	9.287	31.5	6.003	0.720			
						Noon	6.722	30.3	6.524	0.783			
						Night	5.285	30.6	5.128	0.547			
						Total			20.655	2.050	9.02		
				34 Aug. Van Lee, of Destelbergen.	22	Morning ..	9.610	29.7	9.331	0.559			
						Noon	6.400	29.5	6.216	0.435			
						Night	5.140	28.3	4.909	0.560			
						Total			20.546	1.300	6.62		
				36 J. Vergauwen, of Beveren-Waes.	4 15	Morning ..	2.535	29.5	2.462	0.270			
						Noon	1.700	28.3	1.653	0.198			
						Night	1.365	29.5	1.325	0.163			
						Total			5.410	0.631	11.60		

¹ First prize.² Ninth prize.³ Seventh prize.

TABLE No. 3.—Showing quantity and quality of milk, &c.—Continued.

Number of cows.	Proprietors.	Time of calving to day of test, July 12, 1881.	Hour of milking.	Weight of milk (in kilos.).	Density of milk at 59° F.	Product of each milking (in liters).	Volume of cream in product of each milking (in liters).	Amount per cent. of cream in the milkings when taken together.	Volume of cream according to the time of calving (in liters).	Coefficient from Table III with which to multiply totals in column 7.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		
37	M. Dobbelaere-Hulin ...	1	Morning .. Noon Night	3.120 2.170 1.730	31.7 32.7 31.6	3.024 2.101 1.677	0.171 0.111 0.112	5.79		
			Total			6.802	0.394			
39	J. Van Damme, of Saffelare.	(?)	Morning .. Noon Night	3.865 2.542 1.410	32.1 32.2 32.5	3.745 2.461 1.363	0.273 0.172 0.118	7.30		
			Total			7.571	0.563			
42	D. Vincent, of Lerne St. Martin.	3	Morning .. Noon Night	8.050 7.460 0.350	30.4 30.0 29.5	8.080 7.242 0.168	0.608 0.651 0.536	8.12	2.413	1.3435
			Total			22.096	1.795			
43	H. Haclterman, of Onltre.	6	Morning .. Noon Night	7.880 5.990 4.350	33.5 33.6 32.8	7.624 5.795 4.211	0.587 0.463 0.421	8.34	3.172	2.1551
			Total			17.630	1.471			
44	P. Vanlangenhacke, of Appelterre. ¹	1	Morning .. Noon Night	11.550 8.650 5.000	32.2 29.7 32.2	11.189 8.401 4.902	1.312 1.318 0.490	12.86	3.333	1.0373
			Total			34.492	3.150			
45	F. Martens, of La Pinte	1	Morning .. Noon Night	3.500 2.850 2.300	34.4 33.6 33.4	3.441 2.757 2.283	0.344 0.273 0.280	10.60		
			Total			8.481	0.899			
51	S. Dossche, of Melle	5	Morning .. Noon Night	9.380 6.800 5.320	31.5 31.4 30.6	9.083 6.593 5.162	0.700 0.705 0.583	9.53	3.170	1.5035
			Total			20.818	1.988			
52	L. DeWilde, of Moortzele ²	5	Morning .. Noon Night	11.140 7.070 6.260	32.4 29.2 30.6	10.790 7.743 6.074	0.863 0.875 0.772	10.20	4.148	1.6325
			Total			24.607	2.510			
53	J. Van Impe, of Semmerzake.	7	Morning .. Noon Night	5.960 4.853 4.632	33.8 33.3 32.8	5.705 4.696 4.485	0.708 0.504 0.718	13.75	2.050	1.6000
			Total			14.946	2.050			
57	J. Vandevoorde, of Ervelde.	11	Morning .. Noon Night	5.477 5.280 4.262	30.9 31.1 29.5	5.312 5.127 4.139	0.478 0.547 0.552	10.85		
			Total			14.578	1.577			
58	MM. De Beer, frères, of Gand.	1	Morning .. Noon Night	7.020 7.300 5.850	34.1 32.2 31.7	7.369 7.072 5.679	0.639 0.684 0.540	0.30		
			Total			20.120	1.872			

¹ Honorable mention.² Sixth prize

Number of cows.	Pr
62	T. Van Meyghem
60	J. De Ry
67	P. G. Dellys ²
68	P. F. Bolanbeke. ³
69	E. Verdegem Maria-L
72	Veuve H. Wykel.
73	Hospices of
71	Veuve Delaro. ⁴
80	Veuve et en vooorde, of
82	G. Wolters Amand.

¹ Second prize

TABLE No. 3.—Showing quantity and quality of milk, &c.—Continued.

in the three milkings when taken together.		Volume of cream according to Table III at the time of calving (in liters).	Coefficient from Table III with which to multiply totals in column 7.	Number of c. w.s.	Proprietors.	Time of calving to day of test, July 12, 1881.	Hour of milking.	Weight of milk (in kilos.).	Density of milk at 56° F.	Product of each milking (in liters).	Volume of cream in product of each milking (in liters).	Amount per cent. of cream in the three milkings when taken together.	Volume of cream according to Table III at the time of calving (in liters).	Coefficient from Table III with which to multiply totals in column 7.
(8)	(9)													
					(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
5.79					62 T. Van Wouterghem, of Meyghem. ¹	27	Morning ..	13.990	34.4	13.525	1.713	13.93	5.534	1.1624
							Noon	12.560	33.6	12.132	1.944			
							Night	8.907	32.8	8.624	1.121			
							Total			31.391	4.778			
7.30					66 J. De Ruyte, of Beleselo...	23	Morning ..	10.295	34.1	9.955	1.195	12.25		
							Noon	8.042	34.7	7.771	0.933			
							Night	6.053	33.9	5.894	0.762			
							Total			23.530	2.890			
8.12	2.413	1.3435			67 B ^{re} G. Della Faille, of Huybro. ²	4 2	Morning ..	11.319	32.5	10.902	1.461	12.94	4.934	1.4598
							Noon	8.852	31.7	8.580	1.087			
							Night	7.153	31.7	6.935	0.879			
							Total			26.477	3.427			
8.34	3.172	2.1551			68 P. F. Bolangier, of Meirelbeke. ³	3 3	Morning ..	11.810	30.6	11.459	0.849	10.28	4.196	1.3142
							Noon	10.670	29.5	10.364	0.967			
							Night	9.480	26.3	9.237	1.366			
							Total			31.060	3.192			
12.86	3.333	1.0573			69 E. Verdegem, of Bachte-Maria-Leerno.	10 4	Morning ..	4.913	33.6	4.759	0.571	12.42		
							Noon	3.907	32.6	3.784	0.504			
							Night	3.137	32.8	3.037	0.364			
							Total			11.580	1.439			
0.60					72 Veuve Hamerlinck, of Wynkel.	3 15	Morning ..	8.825	31.5	8.555	0.456	7.20	2.62	1.3741
							Noon	0.600	29.5	0.411	0.534			
							Night	5.410	30.0	5.232	0.482			
							Total			20.218	1.472			
0.53	3.170	1.5005			73 Hospices of Moerbeke ⁴ ...	3 20	Morning ..	11.030	30.4	11.378	0.964	11.72	4.442	1.3741
							Noon	8.640	30.6	8.383	0.922			
							Night	7.835	27.8	7.624	1.347			
							Total			27.585	3.233			
0.20	4.148	1.6325			74 Veuve Dellaert, of Saffelaro. ⁵	6 27	Morning ..	4.435	31.9	4.267	0.675	15.80	3.393	2.1551
							Noon	3.035	31.4	2.941	0.450			
							Night	2.815	31.4	2.728	0.450			
							Total			9.966	1.575			
3.72	2.050	1.0000			80 Veuve et enfants Vandevoorde, of Ertvelde.	10 2	Morning ..	9.790	35.5	9.451	0.806	10.60		
							Noon	8.260	32.2	8.002	0.880			
							Night	6.675	31.2	6.667	0.810			
							Total			24.123	2.556			
0.82					82 G. Wolters, of Mont St. Amand.	10	Morning ..	11.180	33.0	10.822	0.830	8.37	2.334	1.0137
							Noon	8.770	33.3	8.487	0.721			
							Night	8.400	33.4	8.186	0.751			
							Total			27.405	2.302			

¹ Second prize. ² Fourth prize. ³ Fifth prize. ⁴ Third prize. ⁵ Honorable mention.

TRANSPORTATION OF BELGIAN CATTLE TO THE UNITED STATES.

The intent of this dispatch would fail if I said nothing about transportation.

The law and regulations in force in the United States concerning tariff, inspection, and entry can be better determined there.

Cattle cannot be carried across the Atlantic with either safety or profit in sailing vessels. Steamships do not always take them. They must be offered in lots large enough to pay the expense of fitting up stalls for their accommodation. It may be recognized as the rule that steamships which carry passengers, either saloon or emigrant, will not carry cattle. There, doubtless, are exceptions, but not many. The authorities at New York object.

The White Cross line of steamers, Steinmann & Ludwig, Antwerp, agents, carry all the cattle from Belgium (and I believe from Holland) to the United States. They run to New York and to Montreal.

These shipments have been (to New York) in summer of 1880, 169 cattle; in summer of 1881, 230 cattle.

Two shipments have been made this present season to Montreal.

The prices are as follows:

	Per head.
Bulls and cows on deck.....	£5
Yearlings	4
Calves	3
Under deck, additional	1

The ship puts up the stalls and supplies the water; feed and men to care for the cattle are for shipper's account. French, Edge & Co., of New York, are agents for this line.

Canada has been interesting herself in the manner suggested to Americans in this dispatch. She has imported, for breeding purposes alone, from Belgium during the past year 62 head of cattle, and from England 32 bulls, 336 cows, and 21 calves, while her exports for beef have been, during the year 1880, to England alone, 50,905 head.

As to transportation: Mr. John C. Moosily, agent Red Star steamers, Antwerp; Steinmann & Ludwig, agents White Cross steamers, Antwerp; Wambersie & Son, ship-brokers, Rotterdam.

EXPORTATION OF AMERICAN HORSES TO BELGIUM.

Of course no recommendation of mine or indeed of any consul could be accepted upon our judgment solely or without examination and trial, but I venture to express my belief that a good business man—a judge of horses and cattle—could make a profitable business by the importation of cattle to the United States, as I have suggested, and, for a return cargo, exporting horses for use in Belgium, Holland, and France. The prices are high here, and for light driving and riding horses I think remunerative prices could be obtained.

This trade is already commenced, but is in its infancy. I hope my notice of it will attract the attention of those concerned.

A cargo of 60 American horses (mares) were landed within the past month at Bruges, in this consular district, and sold there at auction, bringing fair and satisfactory prices.

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AUTHORITIES AND SOURCES OF INFORMATION.

I have been a personal witness to many of the things I have described; but I have received material aid in my examinations from the following gentlemen, to whom I tender my acknowledgments: Professor Leyder, of the Royal Agricultural Institute at Gaubloux, Belgium; Louis Tydgadt, esq., secretary of the Agricultural Society of Flandre Orientale, Ghent; Mr. P. F. L. Waldeck, secretary Holland Society, Loosdianen, near The Hague; Professor Bonar, agricultural engineer; Selzaete, director of abattoir, Brussels; Mr. Edward Minne, inspector of abattoir, Ghent; report of jury on quantity and quality of milk, prepared by Professor Chevron, of the Royal Agricultural Institute at Gaubloux.

THOMAS WILSON,
Consul.

UNITED STATES CONSULATE,
Ghent, October 27, 1881.

Per head.
..... £5
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SPAIN.

CATTLE IN ANDALUSIA

REPORT BY CONSUL OPPENHEIM, OF CADIZ.

In pursuance of instructions given in Department circular of July 18, 1883, I transmit herewith certain tables bearing upon the grazing interest in this district. Stock-breeding, properly so-called, meaning thereby the improvement of cattle on a large scale by selection and crossing, may be said not to exist here. Individual experiments of crossing foreign cattle with the native breed have occasionally been made, but the results are said not to have been encouraging. Some years ago English Shorthorn cows were imported into the district of Jerez and crossed with the native bulls, but the experiment was unsuccessful, the breed deteriorating rapidly and tending to revert to the original native type. In the district of Puerto de Sta. Maria, there are now some cross-breeds, produced by crossing Swiss and native cattle (native bull and Swiss cows); the milk product of the cross-breed cow is much superior to that of the native, both in richness and in quantity, but the animals lose their hardiness, do not stand the heat well, and require shelter and artificial feeding almost the whole year round. These experiments, and probably many other similar ones unknown to me, have created an impression that the native stock of this district does not lend itself readily to improvement by crossing. The interest of this inquiry to our dairy-men and cattle-breeders must further be lessened by the patent fact that the Andalusian cattle, outside of a good appearance and endurance of heat, do not seem to have any prominent points of excellence. They are not good milkers, and produce beef which, at its best, is only mediocre. On the other hand they are very cheaply kept, requiring hardly any shelter or care of any kind. That American breeders should import Andalusian stock is only conceivable in the somewhat remote contingency of our people developing a taste for bull-fighting. The fierceness and the mettle of the Andalusian bull are indisputable, and these traits are sufficiently developed even in some of the cows to make them somewhat undesirable as inmates of a dairy. Whilst the above considerations undoubtedly detract from the practical value of this inquiry to our stock-breeders, yet many interesting facts and data bearing upon the meteorology, the topography, the flora, as well as on the economical situation of this district may be included within its frame-work. Such of these data as are contained in the accompanying tables have been gathered in every case from the best available sources, and as far as they go are undoubtedly trustworthy.

ERNEST L. OPPENHEIM,

Consul.

UNITED STATES CONSULATE,
Cadiz, October 25, 1884.

San Fernando
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Topography of the province of Cadiz.

Locality.	Altitude of highest point in meters above sea level.	Locality.	Altitude of highest point in meters above sea level.
San Fernando. (Bay of Cadiz).....	29.5	Sierra de Gibraltar	410—
Puerto Real (Bay of Cadiz).....	9.5	Medina.....	250—
Puerto de Sta. Maria (Bay of Cadiz)....	8.5	Chiclana.....	380—
Arocs.....	141—	Olvera.....	1,124—
Jerez.....	50—	Grazalema.....	1,750—
Utrera.....	43—		

NOTE.—The annual rainfall at the observatory of San Fernando is given at 656.03^{mm} (about 26 inches) this being the mean of ten years' observations. During the last two years the temperature of the soil has been taken daily, giving mean of temperature: At a depth of 0.63^m—17.6° centigrade; at a depth of 1.30^m—18.8° centigrade.

Mean temperature, 17.9° C. Summer, 23.1° C. Winter, 12.0° C., being results of ten years' observations at the San Fernando Observatory, and believed to be approximately correct for the coast districts and the lands where altitude does not exceed 50 meters above sea-level. In the central districts, and up to an altitude of about 250 meters above sea-level, the mean annual temperature is 15° centigrade; on the higher uplands, from 250 to 1,000 meters above sea-level, it is 12° centigrade.

SOIL.—*Alluvial*: There is some alluvial pasture on the Guadalete, the Guadalquivir, and other minor streams; this represents, however, but a very small percentage of the total pasturage. *Loam*: There is but little of this kind of soil in the province; the district of Olvera includes some largish tracts of "clayey loam" devoted to pasturage. *Clay and chalk*: These soils are frequently met with in natural meadows, especially in the higher pastures, probably representing from 35 to 40 per cent. of total grazing area in this province. *Sandy, &c.*: A large portion of the natural pastures of this province has sandy or gravelly soil; 40 to 45 per cent. is a fair estimate of the percentage having such soil.

Pasturage of Western Andalusia—species most abundant in natural pasture.

ORDER LEGUMINÆ.

Trifolium pratensis: wild clover, red and white.
Lotus corniculatus.
Hedysarum coronarium: French honey-suckle.
Hedysarum honobrichus.
Lathyrus silvestris: wild vetch.
Medicago sativa: lucerne.
Medicago lupulina.

ORDER GRAMINÆ.

Avena fatua: wild oats.
Poa trivialis: meadow grass, chiefly the rough-stalked variety.
Lotium multiflorum: Italian rye-grass.
Festuca: fescue grasses, many varieties.
Bromus: brome-grass.
Triticum repens: couch-grass.
Phalaris canariensis: canary-grass.
Carlina acaulis: carline thistle.

CULTIVATED GRASSES.

Artificial pasture is very uncommon in this district, though here and there experiments have been made in that line; such pasture here seems to require very damp situations. In such spots clover (from American seed), with giant Italian rye-grass (from English seed), have given very good results.

A natural meadow, situate on undulating ground, near the river Guadalete, is estimated by its owner (a life-long agronomist) to have the following composition: Wild clover, (*Trifolium pratensis*) about 10 per cent.; couch-grass (*Triticum repens*) about 60 per cent.; wild canary-grass (*Phalaris canariensis*) about 5 per cent.; Italian

rye-grass (*Lolium temulentum*) about 10 per cent; leaving about 15 per cent. for miscellaneous grasses and weeds, and this is believed to be a fair type of the natural pasture of the coast districts and less elevated lands. The upper pastures (from 250 meters above sea-level upwards) covering, probably, 60 per cent. of the total in the province, have a smaller proportion of Legumine than the low-lying tracts; wild clover is absent, and lucerne (*Medicago sativa*) takes its place; the French honeysuckle is very abundant, especially on chalky hill-sides and table-lands. Amongst the Gramineae, the fescue grasses, wild oats, brome and the meadow grasses (*Poa*) thrive most luxuriantly in the higher pastures, and these species undoubtedly furnish a large proportion of the upland herbage.

Statement showing the area of pasture lands in the province of Cadiz.

[Total area of province 7,275 kilometers.]

Locality (Judicial districts).	Natural pasture, treeless.	Natural pasture, lim- bered.	Totals.	Altitude of highest point in each district above sea- level.
	Hectares.	Hectares.	Hectares.	Meters.
Algeciras.....	30,174	11,405	41,579	410
Arco.....	8,047	6,863	15,800	141
Cadiz.....	62	.....	62	16
Grazalema.....	9,130	9,058	18,187	11,750
Chiclana.....	24,245	5,983	30,227	360
Jerez.....	13,419	40,090	53,509	50
Medina.....	21,447	35,350	56,800	250
Olvera.....	3,334	10,525	13,859	51,124
Puerto Sta. Maria.....	7,758	1,010	9,677	8.5
San Fernando.....	257	.....	257	29.5
Sanlúcar.....	6,315	554	6,873	110
San Roque.....	13,818	34,927	48,745	1400
	138,915	157,585	296,500	

* Sierra de Gibraltar. † Altitude estimated, not measured. ‡ Cerro del Pinar. § Pico del Aljibe.

NOTE.—The hectare = 2.47114 acres.

Statistics of cattle of Western Andalusia.

Measurements taken.	Size at maturity.		
	Cow.	Bull.	Ox.
Height.....	Ft. 4	Ft. 4	Ft. 4
Girth.....	4 4	4 10	4 7
Length of head.....	6 7	7 4	6 10
Breadth of head.....	1 8	2 3	2 2
Length of horns.....	10	1 4	1 2
	1 6	2 6	2 3

Name of breed : Andalusian.

Yield of milk : Milk is rarely collected; quantity of dairy yield of a fair cow is estimated at 7 kilograms per day.

Milk to pounds of butter : Unknown; butter-making as a regular industry does not exist.

Milk to pounds of cheese : Unknown; very little cheese is made.

LIVE WEIGHT.—Cow: 255 kilograms; bull: 380 kilograms; ox: 335 kilograms.

Age at maturity : Four and a half to five years.

WEIGHT OF MEAT AT MATURITY.—Ox: 225 kilograms; bull: 260 kilograms; cow: 170 kilograms.

Color : Pure black and pure red cattle are the most abundant; next common are spotted black and white, then spotted red and white.

Description : The Andalusian cattle are fairly proportioned animals, neither high nor low on the leg; rather deep-chested and clear-limbed. The contour of the back

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Olvera.....
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San Fernando.....
Sanlúcar.....
San Roque.....

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is level, what is called in English grazier parlance "square-cut." The horns as a rule spread at right angles from the head, ends being curved slightly upwards. The head is of normal shape, tapering, however, a good deal towards the muzzle.

How long bred pure: From time immemorial very few foreign animals have ever been imported for cross-breeding purposes, and those few only very recently, so that the practical results of cross-breeding are not definitely established.

Labor: Oxen work up to about nine years of age, thus giving about four years' plowing or hauling: the usefulness of a good steer at either work is considered equal to that of a mule, whilst cost of feeding the steer is only estimated at about half.

Milk: But rarely collected.

Cheese: Hardly any made.

Methods of housing: Are of the most primitive character, as dairying is not practiced, there are but very few cow stables. On most farms rough, open sheds are provided, under which animals seek shelter during inclement weather.

Feeding: It is the general custom to turn all animals but working oxen loose on the natural pasture; working oxen are fed during the three or four winter months on fens (tares) and chopped straw, the rest of the year on grass only.

Breeding: Very little attention is paid to breeding, unless in the case of breeding bulls for the "Plaza." The desirable points in these animals being fierceness and mettle, only cows exhibiting these traits are used as dams; the process of selection is by having the animals lightly goaded by a man on horseback (el tentador) and those that turn upon the horse and exhibit most bravery are reserved for breeding.

Handling products: The production of cow's milk, butter, and cheese is very small; the local consumption of the two latter articles is supplied by other districts, and goat's milk is in general use. Hence it may be said that the products of the grazing industry in this province are beef and labor.

Statement showing the number of domestic animals in the province of Cadiz (year 1880).

Locality. (Judicial districts.)	Horses.	Mules.	Asses.	Neat cattle.	Sheep.	Goats.	Hogs.
Algeciras	1,379	85	595	8,633	6,953	8,077	5,397
Arcos	3,458	807	1,079	6,537	20,404	6,280	2,625
Cadiz	520	110	304	20			
Grazalema	200	153	251	2,008	4,817	11,704	1,389
Chiclana	1,085	306	640	7,917	6,529	4,719	3,674
Jerez	5,552	397	1,206	17,079	11,876	4,881	711
Medina	1,753	412	1,123	9,227	14,534	11,071	3,061
Olivenza	912	654	1,205	2,210	5,527	7,716	3,909
Puerto-San-Maria	496	114	1,116	1,815	766	2,918	400
San Fernando	58	45	50	100			58
Sanlúcar	420	78		785	1,695	298	150
San Roque	1,021	115		4,182	5,391	9,184	1,310
Total	17,550	360	8,778	60,653	87,494	69,553	22,124

*The number of hogs in the district of Jerez is known to exceed considerably the figure given here.

CATTLE IN CATALONIA.

Catalonia is not a stock-raising province, with the exception of mules in the northwestern portion near the Pyrenees. The province of Catalonia is almost entirely an agricultural and not a stock-raising one. Only one-fourth of all cattle for the market is raised in the province, while three-fourths are imported as follows:

Beef.—During the winter from the Basque provinces and Galicia; during the summer from Argelia, Africa.

Milk cows.—Entirely from Switzerland at high prices.

Sheep.—From the De la Mancha, Spain, and Murcia.

Pork.—(The sale of which is prohibited during the six months of summer) from Estremadura and France.

All live stock for consumption is of very inferior class, as Catalonians feel no interest in stock breeding, but are entirely absorbed in the cultivation of the grape, almonds, nuts, and vegetables, besides general manufacturing, especially of cotton and woolen fabrics.

Respectfully,

FRED'K H. SCHEUCH,
Consul.

UNITED STATES CONSULATE,
Barcelona, December 12, 1883.

CATTLE IN GALICIA.

REPORT BY CONSUL CARRICARTE, OF CORUNNA.

I have the honor to forward the following statement respecting the cattle of this province:

The name of the cattle bred is Galician; annual average pounds of milk per head, 2,555; live weight per cow, 8 hundred-weight; live weight per ox, 14 hundred-weight; age at maturity, eight years; weight of meat at maturity, 7 hundred-weight; color, yellow; origin of breed, Spain.

Topography.—The altitude of the grazing country vary between 10 feet and 260 feet. The mean temperature as recorded at the capital, Corunna, is 56° Fahrenheit. The soil is of the most varied description and embraces every quality.

The substratum is most generally porous; limestone found in the east and centre of the province, and granite around the western coasts.

Cultivation by rotation of crops is not practiced. Clover and ryegrass are but little sown. On the wheat stubble (in July) oats or barley and turnips are sown to serve as green crops for winter.

Methods of housing.—Common dark stables; manure usually cleared out twice or thrice a year.

Feeding.—Almost all manger feeding as respects oxen, and pasture for cows; much wet meadow land.

Breeding.—Selections of sires little attended to and consequent degeneration as shown in lightness of hind quarters of the beasts.

Handling products.—Hand labor being cheap but little machinery is used, and the methods are primitive in the extreme.

Stock.—The stock of cattle is in excess of home demands. The surplus is exported to England and may be calculated to reach 40,000 oxen annually; the medium price per head being \$75.

HOW TO EXPORT GALICIAN CATTLE TO THE UNITED STATES.

The best method for transporting cattle to the United States is via Liverpool or Plymouth, England; and the freight paid to either of these ports is \$8 or \$10 per head. The class of beasts for exportation to the United States should be young oxen from sixteen to eighteen months old, the price of which varies from \$30 to \$50 per beast.

The inclosed photographs are taken from animals belonging to a cargo for England, the price and age of each being noted.

J. DE CARRICARTE,
Consul.

UNITED STATES CONSULATE,
Corunna, March 31, 1884.

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BREEDS OF CATTLE IN GERMANY.

CATTLE IN HESSE-NASSAU AND PRUSSIA.

It has been found very difficult, in the commercial city of Frankfort-on-the-Main and its neighborhood, to obtain any information and data relative to the number, races, properties, and condition of cattle in the province, of which said city is the commercial center. The country around Frankfort is thickly dotted with thriving cities and villages, and the division of landed property has proceeded to such an extent as to make farms or estates of a hundred or several hundreds of acres a rare exception. The populousness of the country, moreover, insuring a ready sale of all the finer and more delicate products of the soil, the raising of which is facilitated by a mild and equable climate, has tended to make the raising and maintenance of cattle comparatively unremunerative. Thus it is, that cattle-breeding and raising is comparatively unknown in the province of Hesse-Nassau, and that one but seldom sees such herds of cattle as abound on the extensive meadows of Northern Germany and the Netherlands.

The temperature of this city and province, although lying entirely above the 50th degree of latitude, is very moderate and equable, indeed. The mean temperature during the thirty years from 1851 to 1880 was 9.9° Celsius; in the warmest year of those thirty years it was 11.3° , and in the coldest 8.2° . The mean temperature in winter is 1.1° , in spring 9.6° , in summer 18.9° , and in fall 9.8° , all of the centigrade scale. The highest point the thermometer reached in the thirty years referred to was 36.6° , on July 21, 1865, and the lowest 21.3° , on January 7, 1861. The mean atmospheric pressure during said years was 753.4^{mm} , and varied between 750.8^{mm} (in 1853) and 757.0^{mm} (in 1854).

The province of Hesse-Nassau embraces the circuits of Cassel and Wiesbaden, and contains an area of 15,692 square kilometers, on which is maintained a population of 1,554,376 inhabitants. The following table will show the number of cattle in said province in the years 1873 and 1883, as found by the official census, viz:

Circuit of Cassel in 1873	270,001
Circuit of Cassel in 1883	272,266
Increase in 10 years	2,265
Circuit of Wiesbaden in 1873	206,367
Circuit of Wiesbaden in 1883	219,450
Increase in 10 years	13,083
Total in the province of Hesse-Nassau:	
In 1873	476,368
In 1883	491,716
Total increase in ten years	15,348

This increase in the province of Hesse-Nassau by far exceeds the average increase in the Kingdom of Prussia, which, although almost twenty-two times the size of said province, increased only 96,075, namely :

Number of cattle in the Kingdom of Prussia :

In 1873	8,639,614
In 1883	8,735,580

Showing the above increase of..... 96,075

THE ORIGIN OF EUROPEAN CATTLE.

The original ancestor of the European races of cattle is called, by scientists who have investigated the subject, *Bos primigenus*, of which original race vestiges can be followed up as far as the proofs for the presence of human beings themselves go. At present this primitive form of cattle is only found in the wild Park steer of Chillingham, Scotland, although the climate has considerably reduced his form. This race, however, can only be considered as the wild typical form of European cattle, it having entirely disappeared from Europe, excepting the reduced race of Scotland referred to. The two great groups of cattle which have inherited the type of the *Bos primigenus* are :

(1) The lowland cattle of Northwestern and Western Europe, notably in Holland, Freisland, on the Lower Elbe, in the plains of Dantzic, in Flanders, in the Ardennes, in Picardy, Normandy, and Bretagne, and in the eastern countries of England (Shorthorns).

(2) The steppe-cattle of Southeastern and Eastern, Western and Northern Europe, the Romanic race in Italy, the cattle of Scotland and Wales.

Next to the race of *Bos primigenus*, and as a branch and modification thereof, the race called *Bos frontosus* was discovered, from which are descended the variegated cattle of Switzerland (Bernier, Simmenthaler, Saanenhaler, and Freiburger), the similarly-typed races of the Tyrol and Salzburg (Zillerthaler, Duxthaler, Pinzgauer, &c.), the Miesbacher type of Upper Bavaria; the Egerland and Voigtland cattle of Bohemia and Saxony, and probably, also, the hornless cattle of England, Scotland, and Norway, and the cattle of Westmoreland, Cumberland, Lancashire, and Devonshire. From another branch of the original *Bos primigenus*, the *Bos brachyceros*, are descended the gray-brown and lighter or darker gray cattle of Switzerland (Schwyitzer, Graubündener, Montafoner, Oberrinthaler, Murthaler, Pusterwalder, and Allgauer); also most of the types of the Pyrenees and the neighboring departments (Landes, Gascogne, Garonne), as well as the dwarfed cow of Shetland. Of course the many crossings between these original races and their descendants have produced numerous intermediate breeds, notably in Middle and Southern Germany, in Austria, in Middle and Eastern France, and in England, which it is impossible now to trace with certainty to either of the great original races mentioned. It will appear from the foregoing statements that a description of the different types or races of cattle of Middle Europe might be attempted, from various different points of view, according to the predilection of the party describing them. One might choose the geographical standpoint describing simply the cattle now existing in the different countries or regions, without reference to affinity or descent; another would describe the groups and races of cattle, which, although not contiguous geographically, would seem to him to have descended from the same original type, while still another would make color the distinguishing feature of this classification. But all these divisions are subject to certain objections, and it re

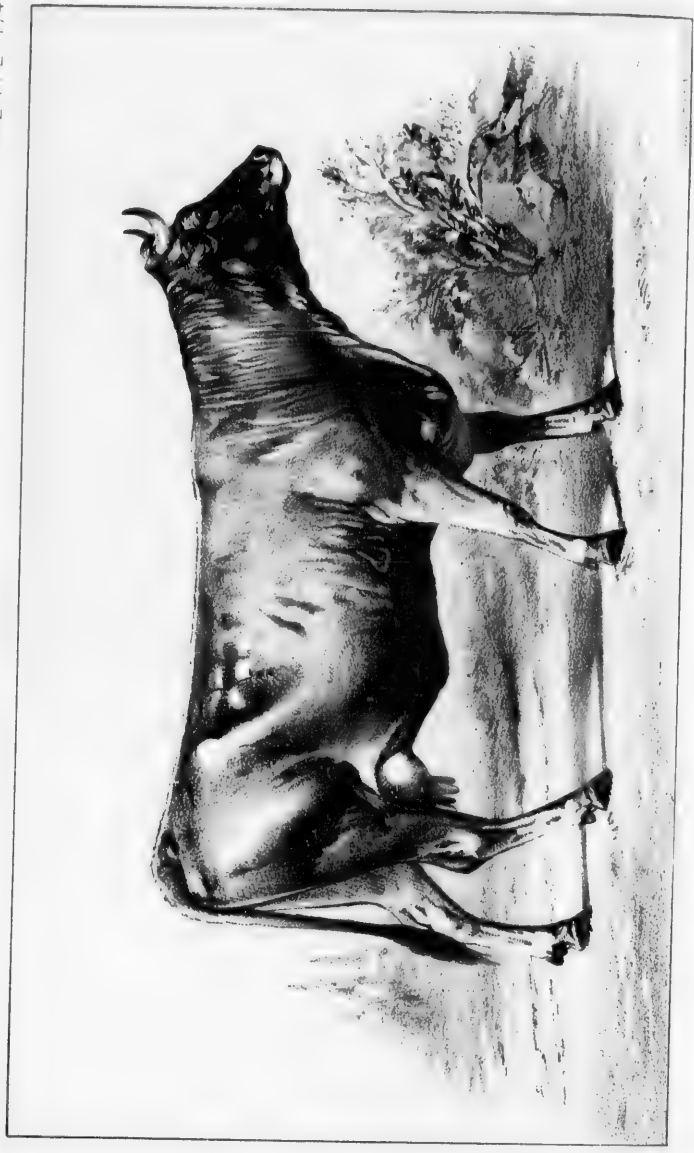
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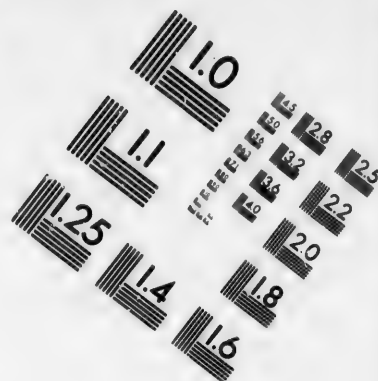
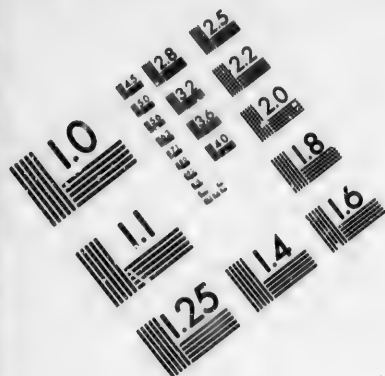
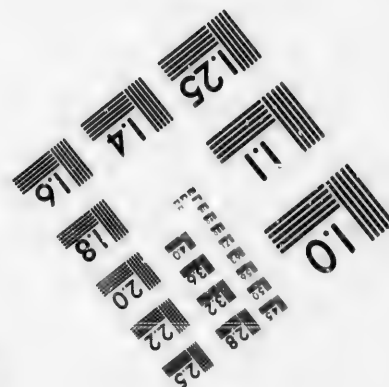
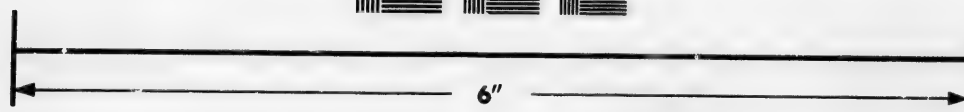
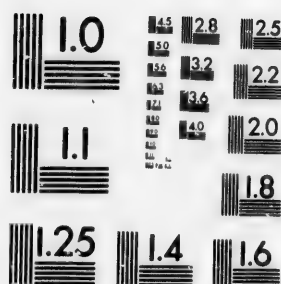


IMAGE EVALUATION TEST TARGET (MT-3)



Photographic Sciences Corporation

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WEBSTER, N.Y. 14580
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Julius Henck & Co. Lith.

SIMMENTHALER RACE



J. H. B. & Co. Lith.

SIMMENTHALER RACE



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mains, therefore, only to take the different types as we now find them and describe them without any attempt at classification.

I.—THE NECKAR RACE.

This is the leading type of cattle in the Kingdom of Wurtemberg. It is of red color, of large and rather heavy body and deep belly. Other points of description may be gathered from the annexed cut. The live weight of a cow is from 1,100 to 1,300 pounds. This race exceeds the Simmenthaler in the amount of milk furnished, is equally well adapted for the butcher, but inferior as draft animals. When fattened they reach a weight of nearly 2,000 pounds. The calves are unusually large and heavy when born.

II.—THE SIMMENTHALER RACE.

This race is indigenous in the valley of the Simme, Switzerland, and is the race mainly used in Southern Germany to improve the German cattle. Its leading features are: Head small and light, with gentle yet lively expression; horns fine and good, pointed forward and upward; neck short; body well rounded in the ribs; rump broad and long; tail usually sitting high; color generally red, but often variegated; weight averages 1,500 pounds for cows and from 2,400 to 2,600 pounds for bulls. Observations concerning the increase of weight made at Hohenheim, in the Simmen Valley, gave the following results: Animals of one-fourth to one year were fed daily 19 pounds of hay-value, while their average weight was 475 pounds. Heifers, in their second year, received 22 pounds daily, their average weight being 700 pounds. Cows, big with calf, in their third year, averaging in weight 1,000 pounds, were given in feed 28 pounds hay-value per day. The increase of weight was as follows for each 100 pounds of hay-value consumed: With animals of one-fourth to one year, 7.94 pounds; with animals of one to two years, 6.12 pounds; with animals of two to three years, 3.82 pounds. Observations continued during a whole year of rational feeding and its results made with this kind of cattle showed the following results, viz: Quantity of food consumed 17,193 pounds of hay-value, or 47.2 pounds daily, or, taking an average weight of 1,500 pounds, 3.14 pounds for each 100 pounds of body weight.

(It may be proper to state at this point that the expression "hay-value," used in the foregoing statement, means the nutritive properties of the different kinds of feed reduced to the nutritive value of hay.)

The cows so fed yielded an average quantity of 1,823½ quarts (of 4 pounds each) of milk and one calf of an average weight of 96 pounds.

The fattening of this cattle is accomplished with hay and salt alone, the hay in that country being far richer than that of the prairies. The principal markets for fat cattle are Saanen, Chateau d'Oeux, and Rougemont.

III.—THE LIMBOURG RACE.

This type is found in the Belgian province of Limbourg and in a part of Wurtemberg, notably in the districts of Gaildorf, Aalen, Gmund, and in the valleys of the Roth and Leine. The color of this type is silvery-yellow, with now and then a white spot on the forehead. The hide is very fine and pliable, making usually numerous folds on the neck, running from the well-developed dew-lap to the top. The head is long, narrow, and often shows a curved profile. The horns are fine, round,

and generally turned forward and upward. The chest is not well developed; the body small; average weight of cows 650 to 800 pounds; oxen reach 1,600 to 1,700 pounds. They are good milk givers, yielding per year about 1,800 liters of milk, of which 10 pounds will make 1½ pounds of butter.

IV.—THE FRIESDORF RACE.

The original home of this race is Middle Franconia, in Bavaria, notably the districts of Ansbach, Leutershausen, Feuchtwangen, Dinkelsbühl, Wassertrudingen, Gunzenhausen, and Herrieden. The race has become, on account of its good points, one of the most favored of Germany. They excel as draft and butcher animals. The head is strong and long; chest broad and deep; back straight. The legs are high, yet strong. The color is peculiar, being mainly a yellow-red, variegated after the manner of the tiger. Of course, there are exceptions, such as black and brown variegations; but such specimens are not considered desirable. The live weight of cows is 1,000 to 1,100 pounds, of oxen 1,300 to 1,800. Average cows yield 1,300 liters of milk per year; large ones, weighing between 1,100 and 1,250 pounds, 2,000 liters. Sixteen liters of milk yield a pound of butter. The calves are unusually large. The principal market for draft oxen of this type is Ansbach.

V.—THE ALB RACE.

This is one of the best milk-giving races of Germany. It is pre-eminently the cow of the small farmer of Southern Germany, who looks to the cow not only for the milk to supply his house demand, but who also puts her to the plow and wagon. It is a small type, scarcely ever exceeding 800 pounds in weight and falling often below 550 pounds. They thrive on scanty feed. Their color is yellowish-red. The calves are usually very small. This race is now being improved by crossing it with the Simmenthaler race.

VI.—THE SCHWAB HALL RACE.

This race is so called because for many decades it has been mainly bred in the region of Schwäbisch Hall. They are a rather heavy dark-red to chestnut-brown race, showing more or less white only about the head. The cows weigh from 850 to 1,000 pounds, and the oxen from 1,750 to 1,900 pounds. The latter, on account of the strength and regularity of their limbs, are much sought as draft-animals, the more because they are easily fattened, when no longer fit for draft purposes, and furnish excellent meat.

VII.—THE DUTCH RACE.

This race is the leading representative of the lowland races, and is mainly sought in the neighborhood of large cities, where the sale of fresh milk is profitable. It can be found, however, in all parts of Northern Germany, where feed is abundant. The finest and heaviest specimens of this type are bred in the neighborhood of Leyden. The head of the Holland cattle is long, narrow, and light, with broad mouth and horns always pointing forward, their black tips being usually turned upward. The long neck, with but indifferently developed dew lap, frequently shows a slight depression on the ridge. Chest and back are broad, and

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Julius Henckes, 1896

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Julius Rosen & Co. Inc.



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Julius P. Smith & Co. Inc.

SCHWAB HALLER RACE

1895-1900, 1901-1902



SCHWAB HALLER RACE

HOLLANDER RACE

Source: From V. S. 1000



HOLLANDER RACE



Julius Henz & Co. Lith.

PINZGAUER RACE

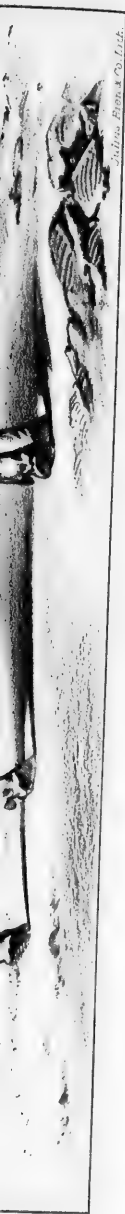
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the line of the back, with rare exceptions, straight to the tail. The body is long, limbs flat and high, hind legs of cows often inclining to be knock-kneed. The most profitable of this kind of cattle are bought in Friesland (in the north of Holland); these are very heavy, with fine bones, delicate skin, and in color mostly white, with black, gray-blue, gray, or even dark-brown spots. Their live weight averages 1,300 pounds. It has been ascertained that the efforts to increase the size and beauty of this cattle, which have been quite successful, have resulted in diminishing their milk-giving properties, so that a decrease of 150 liters per year, as compared with former estimates, has been established. The average amount of milk now is about 2,700 liters per year, the cows yielding about 27 liters per hundredweight of hay-value, these 27 liters making about 2 pounds of butter. The cows require plenty of feed, but remain lean while giving milk; when permitted to "stand dry," that is, when no longer milked, they fatten quickly. By reason of their weight they make good draft-animals, but much depends in each case upon the formation of the skeleton, especially the position of the legs.

VIII.—THE MONTAFONER RACE.

This is a branch of the Schwytzer race. It does not belong to the heavy races as the former, but is of medium weight. Cows average about 1,100 pounds. The color is mostly black, to black-brown, with gray mouth, a gray stripe along the back, and light hair in the ears. The head is small, forehead broad, horns white at the base, otherwise black. The neck is short, dew-lap much developed, chest broad. The back inclines to making a slight downward curve (sway-back). The udder is large. The quantity of milk yielded by good cows amounts frequently to 1,900 liters. The milk is of good quality, 100 liters giving 10 pounds of butter and 17 pounds of cheese. The oxen feed well, grow very heavy, make good draft-animals, and are easily fattened; the meat, however, is coarse-grained. The home of this race is the valley of Montafone, from Bludenz to Schluns, near the Lake of Constance, the latter place being the principal market.

Although the Montafoner cattle are naturally a pasture-cattle, yet they thrive very well in stables, and hence have spread over a large part of Germany.

IX.—THE MIESBACHER RACE.

This race is a combination of the Pinzgauer and Fruitiger races, and has its home in the Bavarian mountains in the neighborhood of Miesbach, Holzkirchen, and Tolz. It is a small race, cows averaging only 750 to 850 pounds, but the form is that of finely shaped mountain cattle; color usually white with yellow or red spots. The yield of milk reaches 2,100 liters per year.

X.—THE PINZGAUER RACE.

From their original home in Austrian Salzkammergut this race has spread into the adjoining regions of the Tyrol and Upper Austria as far as Wels. They are also found in the neighborhood of Ems and Saint Florian and in the Bavarian mountains. The principal markets for them in Salzkammergut are: Salzburg, Althennig, Oberndorf, Oberalm, Manafeld, Saint Leonhard, and Saalfelden; in the Pinzgau: Mittersill and Zell-on-the-Lake; in the Pongau: Saint Johann and Nerfen; in the

Lungau: Mauterndorf. Outside of the province of Salzburg important markets are: Zimmelkarn in Upper Austria, Kufstein in the Tyrol, and Tittmaning in Upper Bavaria.

The animals are mostly red to red-brown, with a white stripe commencing between the shoulders, widening between the rump bones and then narrowing again at the tail. Sometimes this white field extends over the loins and hind legs. The skin is fine and elastic. The head is short, broad between the eyes; horns finely shaped, pointing outward and upward, white with black tips. The neck is thin, with well formed dew-lap; body long, frequently higher at the shoulders than behind; position and movement of limbs correct. They are a fine mountain race, showing all the points of good milkers. They make good draft-animals, and fatten quickly, yielding a superior quality of meat. The cows weigh about 850 pounds, and the annual yield of milk is estimated at 1,600 liters, of which 13 make a pound of butter.

XI.—THE ALLGAUER RACE.

Originally bred in the Alpine regions of Southofen, Immenstadt and Füssen, this race has, by reason of its adaptability to all the purposes of the small farmer, its ability to live and thrive on scanty food, and its long-preserved usefulness, spread over a large extent of country, and is now being imported very largely into Saxony, Baden, Prussia, Bohemia, and even Poland and Hungary. Although the smallest of the brown-gray races, it is yet of middle size. The cows weigh 850 to 1,000 pounds. The color is gray or yellow-brown, always showing the black doe-mouth and a darker shade along the loins and neck. The skeleton is much finer than that of the Montafoner and Rigi races. The head is small and finely shaped, neck short, with well-developed dew-lap, horns white at the base and getting darker towards the points, which are black; body finely shaped and well knit. The chest, as with all good milk givers, is not very wide, but the smaller ribs are wide, the belly broad and deep. The oxen become remarkably heavy as compared with the cows and bulls. Cows of 750 to 900 pounds, consuming a quantity of feed equal to about 25 pounds of hay-value, yield 1,980 liters of milk per year, of which 10 liters make a pound of butter. Experiments made in Saxony have shown that a consumption of 100 pounds of hay-value produced with the Allgauer race 29.38 liters of milk which made 2.32 pounds of butter, while the Holland race yielded 25.26 liters, which made 1.76 pounds of butter, and the ordinary land-cows of Saxony 23.16 liters of milk, and 1.78 pounds of butter. The Allgauer race therefore excels over the other races named in quantity as well as in quality of milk. The meat, however, has the marked characteristics of that of almost all mountain cattle; it is coarse, dry, and tough. The leading markets for Allgauer cattle are Southofen, Stauffen, and Immenstadt. The season for the purchase of animals is the middle of October, at which time the herdsmen return with their herds from the Alps to the valley. The annexed cut shows a modern stable with hollow iron columns, cement cribs, running water, and good ventilation.

XII.—THE SCHWYTZER RACE.

This race derives its name from the Swiss canton of Schwytz; it is sometimes also called the "Rigi race," after the well-known mountain on the border of said canton. It is now bred, however, not only in said canton, but also in the cantons of St. Gall, Unterwalden, Zurich,

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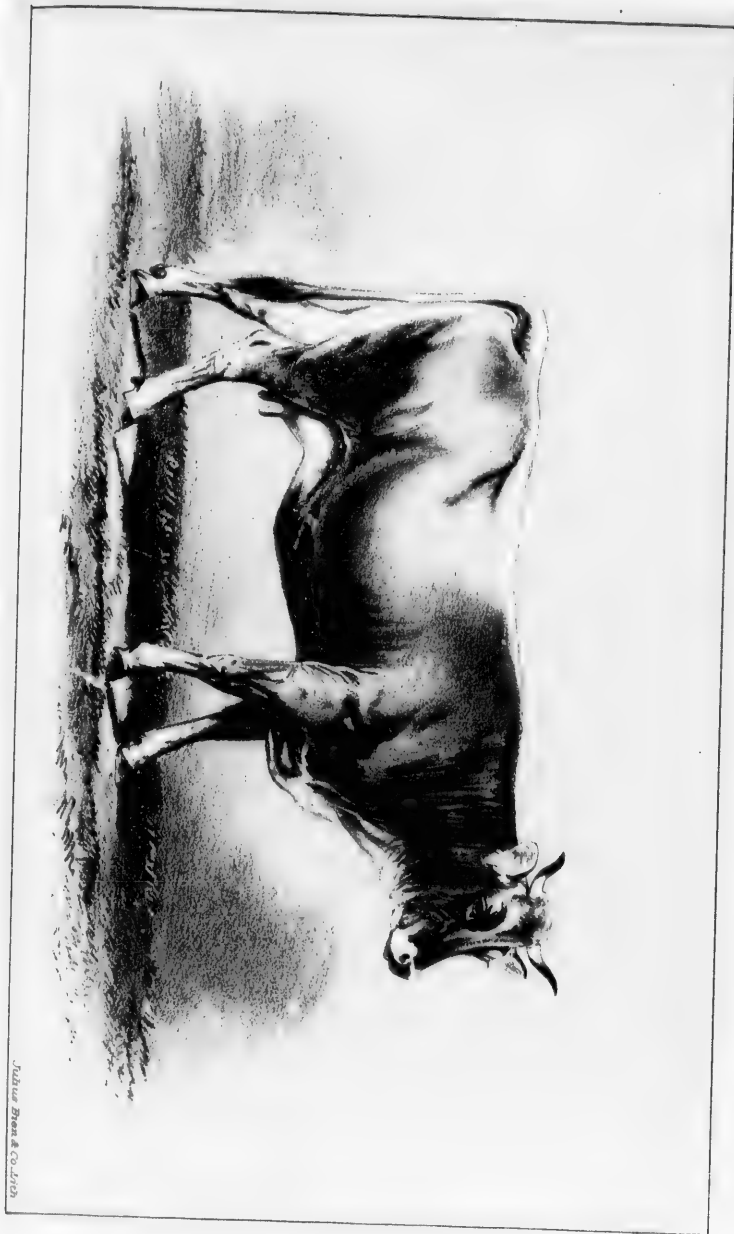
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Julius Ross & Co. Lith.



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Luzern, and Uri. This race, like the Allgauer, is much resorted to to improve the cattle of Bavaria and Wurtemberg. The crossing of the Allgauer and the Schwytzer stock, too, is much practiced to produce a still heavier and more milk-yielding race.

The Schwytzer race is the heaviest and most valuable of the brown-gray races, the cows reaching a weight of 1,400 to 1,650 pounds, and the bulls often weighing more than 2,600 pounds. The bones are massive and heavy, head heavy and broad, mouth large, horns not very fine, of light color, with black tips, ears very large with a yellowish bush of hair protruding from them. The color of the animals ranges from a dark brown to a light gray, with no variation except that the color lightens along the back and at the feet and mouth. The hair is fine, shining, and smooth, the skin soft, but not thin. The neck is strong but not short, dew-lap very large, chest deep, back straight and long. With proper feeding, the cows of this race are the best milk givers of all the mountain races, the milk, moreover, being very rich. The oxen become very heavy, are excellent draft-animals, and fatten easily. The calves of this race are the heaviest of all the mountain races. It is claimed by some that it is difficult to acclimate the race, which, if true, may be because it is difficult to find in other countries pastures so rich and abundant as those of their native cantons.

XIII.—THE VOIGHTLANDER RACE.*

This type of cattle is found in Saxony, Anhalt, in parts of Bavaria, and Bohemia. A race of less than medium size, they do not excel in anything except a certain hardiness, which enables them to thrive on scanty feed and still to furnish somewhere from 1,200 to 1,400 liters of milk per year. The oxen are easily fattened, and the meat is of very desirable quality.

XIV.—THE ANGELN RACE.

This race sits in the low countries of Schleswig, between the German and the Baltic Oceans. There is considerable of stock-breeding in that country of rich and expansive meadows, and large numbers of young cows are annually sent from there into Mecklenburg, Holstein, and Pomerania to stock the dairies of those countries. They are red-brown, of medium size, frugal feeders, and good milk givers. A branch of this race, called Tondern cattle, is much sought by large estate-owners, because heavier and better built and in other respects superior to the ordinary run of the race.

XV.—THE PODOLISCHE RACE.

Originally imported from Southern Russia, this race has become chiefly remarkable from the fact that it has brought the disease known as "rinderpest" into Germany, on which account it is still looked upon with distrust. But its meat is so desirable, and its power of resistance against disease and the influences of climate so great, that nevertheless it is much sought. The percentage of deaths among this cattle, in case of the prevalence of "rinderpest," is less by two-thirds than among other races, while foot and mouth disease and lung diseases are very rare among them. It is not much known in the interior of Germany as

* For portrait of Voightland cow, see report on Voightland cattle, by Consul Bullock, of Annaberg.

yet, but it is claimed that 75 per cent. of all the beef consumed in Vienna, and a large part of that consumed in Paris, is of oxen of the Podolian race. The cut shows the build of the animal, its color, and peculiar horns. It is claimed that this race is a direct descendant of the *Bos primigenus*. It is bred for meat alone, being unfit for draft purposes and yielding but little milk—not more than one-fourth of other races of its size.

XVI.—THE MÜRZTHALER RACE.

This race has also made but little progress into the interior of Germany, having as yet penetrated no farther than the extreme south-eastern parts of Bavaria. They are of gray color, somewhat heavier than the Podolians, yield more milk, and represent a sort of connecting link between the steppe and the mountain races.

PRICES OF GERMAN CATTLE.

The following are the prices of the different races of cattle herein described in German marks—1 mark equal to 24 cents—excepting the Alb and Podolian races, of which I have been unable to ascertain the price. The figures refer to specimens of from four to five years of age:

No.	Race.	Milch cows.	Bulls.
1	Neckar	450 to 500	600 to 800
2	Simmenthaler	600 800	800 1,000
3	Limbürger	400 450	500 600
4	Triebdorfer	400 450	500 600
5	Alb		
6	Schwab Hall		
7	Holland	300 400	400 600
8	Montafoner	500 600	
9	Wiesbacher	500 600	500 600
10	Pinggauer	600 700	700 800
11	Allgauer	500 600	500 600
12	Schwytzer	400 500	500 600
13	Voichtländer	600 800	600 800
14	Angeln	450 550	450 550
15	Podolische	400 550	400 550
16	Mürzthaler	600 800	600 800

CATTLE EXPORTS TO THE UNITED STATES.

The Frankfort district, and indeed the entire Prussian province of Hesse-Nassau, is a cattle-purchasing community, the number of cattle bred falling very largely below the number consumed and needed. Hence there is no export of cattle from this neighborhood. The freight for cattle from this point to Antwerp would cost about \$18 per car holding nine head, or \$2 per head; attendance, feed, and other incidental expenses would amount to about \$4.50 per car, making 50 cents per head; in all, \$2.50 per head to Antwerp. From that point the White Star line of steamers to the United States charge £6, or \$29.20, to New York, making the total cost of transportation \$31.70 per head.

IMPROVEMENT OF CATTLE IN GERMANY.

In conclusion it may be stated that the efforts of the farmers and cattle-breeders of Germany to improve their stock have been as intelligent as they have been persevering, and that the result of these efforts has

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been and is a type of cattle in the different regions of the country entirely adapted to the necessities thereof. Thus it may be said that in general the finer milk-yielding mountain-races are found in the more mountainous parts of the Empire, while the heavy cattle for draft and butchering purposes may be seen in large herds on the extensive meadows of the north.

FERDINAND VOGELER,
Consul-General.

FRANKFORT-ON-THE-MAIN,
January 26, 1884.

CATTLE IN GERMANY.

REPORT BY CONSUL SCHOENLE, OF BARMEN.

HERD-BOOKS AND CATTLE-BREEDING.

It is a historical fact that rational and methodical animal-breeding goes hand in hand with the social and economical status of a people. Wherever civilization and the consequent economical relations of a people are not gradually developed, there the domesticated animals remain more or less in their full originality, and the *primitive* breeds are retained; as, for instance, the small pony-like horse in Upper Silesia and Lithuania, the Merino sheep in Spain, and the high-boned, flat-ribbed hogs in Galicia and Poland. It is therefore but natural that we find the first systematical and successful breeding of live stock in England, where it was improved by experiments and supplemented by scientific methods, thus producing cultivated breeds, which possess a larger inbred producing power than the primitive breeds, which are characterized by a relatively small producing power and by one-sidedness in their performances. England, the cradle of noble-animal breeding, was the first European country which introduced and utilized the so-called cattle and herd books, in which not only the breed but also the color, age, and origin of the animals are minutely entered. In course of time these record books show far-reaching pedigrees, such as the English "Shorthorn Herd-book," founded in the year 1822, exhibits. These herd-books furnish very valuable material for the improvement of the knowledge of animal-breeding and for the critical examination of the breeds and families of animals.

The American stock-raisers availed themselves of the excellent breeding methods of the English, and have since then improved them considerably, and the competition into which American stock-raisers were able to enter with their fellows in the Old World is, to a great extent, to be attributed to their intelligent and advanced breeding methods. In the United States the great value of the herd-books was soon realized, so that the first American herd-book, issued by Mr. Lewis F. Allen in the year 1846, met the hearty approbation of agriculturists as well as stockmen, and its usefulness was so keenly felt that since that time similar herd-books have made their appearance in different parts of the country.

France, Holland, and Switzerland are also in the enjoyment of general herd-books, while Germany does not yet possess a general one, for the one issued by Mr. Stettgast, in 1867, is but a private enterprise, and has

only reference to certain districts. There are, however, strenuous efforts being made by several local cattle-breeding associations for the introduction of a general herd-book, and the German Cattle-breeding and Herd-book Society, founded in Berlin in the year 1880, has already laid down the fundamental principles for such a record book.

CATTLE-BREEDING OF GERMANY.

Live stock in Germany is comparatively not very dense in any district. Northern and Northeastern Germany, with the exception of Schleswig-Holstein and the marshy districts in Oldenburg, is especially poor in cattle and stand in striking contrast with the proportionate cattle richness in the fertile regions of South, Middle, and Western Germany. The head center in cattle-breeding is to be found in the Kingdoms of Bavaria and Wurtemberg, where 3,000 to 4,000 head of cattle average to a German square mile. The poorest districts in cattle are East Pomerania, the province of Brandenburg, the Lüneburger Heath, and the low German moorlands with but 500 to 700 head to a square mile.

This district (Barmen), the narrow Valley of the Wupper, being flanked by a chain of wooded hills on both sides, and the soil being clayish and stony, is chiefly and almost exclusively devoted to industrial pursuits. Agriculture could find neither encouragement nor development, and in consequence thereof cattle-breeding could not be fostered. Cattle-breeding not having the least foothold in this district, all the cattle have to be imported for dairy and slaughtering purposes. In preparing this report I am, therefore, unable to furnish the desired information as to cattle-breeding in this district, so am constrained to dwell but on the general features of the stock of cattle, and lay the most stress on the compilation of statistical tables and the comparative statements of the status of these cloven-footed animals in other German districts and other European countries.

THE SEVERAL BREEDS IN GERMANY.

There are but few distinctly *pure* breeds in Germany, as the Dutch (Flemish), East Friesland, Munsterland, Holstein, and Algau breeds.

The Dutch breed takes the first rank and furnishes the best and most prolific milch cows. They are generally heavy built and of red-checked color.

The East Friesland breed is of a lighter frame, of dark-checked color, and as to the quantity of milk second only to the Dutch cows.

The Munsterland is the next best breed. These cows are of a medium size, of reddish color, and their yield of milk is comparatively copious.

The Holstein breed is somewhat inferior to the foregoing, but is, however, of great productiveness and furnishes large supplies of slaughtering cattle for the English markets.

The Algau breed is the main one in Southern Germany and is frequently used for interbreeding purposes in Bavaria and Wurtemberg.

Other breeds produced by heterogeneous crossings, and consequently mixed ones, are to be found all over Germany, nearly every district throughout the German Empire possessing its peculiar breed.

In Southern Germany Swiss cattle are very frequently drawn upon for breeding purposes, and in the eastern provinces occasional crossings take place between German and Russian stock. On the whole these local breeds have not been improved in their succeeding generations. The Dutch and East Friesland breeds, which are driven into almost every German district, may be considered the predominant pure breeds in Germany.

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CATTLE AND PRODUCT SUPPLY OF BARMEN.

As said in the preface, the immediate surroundings of Barmen and Elberfeld and the adjacent territory are covered with wooded hills and the soil is rather sterile. Consequently neither agriculture nor cattle-breeding could strike any root. The cows are kept only for dairy purposes, there is neither butter nor cheese production going on, the bulk of butter and cheese is drawn from Friesland, Holland, Switzerland, and the southern provinces. Cows are obtained either from the Munsterland or the Friesland or the Dutch breeds. The Munsterland cows yield from 10 to 15 liters of milk a day, and their price averages from \$57.12 to \$64.26; the Friesland cows yield from 14 to 20 liters of milk a day, and their price ranges from \$71.40 to \$85.68; the Dutch cows yield from 20 to 28 liters of milk a day, and their price is in the average from \$99.96 to \$107.10. The last breed is the finest and the most valuable one, and as the importation over the borders is closed from time to time on account of contagious cattle diseases in Holland, these cows can be procured very often with great difficulty. All the cows in Barmen and in its neighborhood are fed on grains and grounds and hay, and during the summer months partly on clover, and are generally kept in the stables. Very few of them are driven into the pastures. These milch cows usually yield milk for a year or fifteen months; then they become dry, when they are fattened for the butcher. Those cows are replaced by a fresh supply from Munsterland or Friesland or Holland, and this process is continually repeated.

TOTAL NUMBER OF CATTLE IN GERMANY.

The census of live stock in Germany is taken every ten years. The last one was taken January 10, 1883. The following statement exhibits the aggregate number and the different kinds of cattle in the whole German Empire in the year 1873:

Calves below one-half year	1,469,581
Young cattle from one-half to two years	3,545,572
Cows	8,961,221
Oxen	1,564,741
Bulls	235,587
Aggregate number of cattle in 1873	15,776,702

The number of cattle in the German Empire averaged 1,606 head to a German square mile, and 38.4 to every one hundred inhabitants in 1873. The census of 1883 is not obtainable at this time; the aggregate number will, however, most likely exceed that in 1873 but very little. The excess in cattle of home demand is comparatively small, the surplus is exported to England and a small lot to France. The surplus in 1876 amounted to 56,942, in 1878 to 24,582, in 1880 to 90,224, and in 1881 to 86,893 head of cattle.

The cattle census in the Kingdom of Prussia resulted as follows:

Years.	Cattle to a German square mile.	Cattle to every one hundred inhabitants.	Total cattle.
1883	1,395	52	8,735,589
1873	1,361	35	8,639,514
Increase			96,075

The number of cattle in the two provinces of Westphalia and Rhenish Province, large portions of which belong to this consular district, is exhibited in the following table:

Province.	Years.	Cattle to a German square mile.	Cattle to every one hundred inhabitants.	Total cattle.
Westphalia	1873	1,537	33	567,975
Do.	1883	1,438	30.7	526,503
Rhenish Province	1873	2,003	37	987,631
Do.	1883	1,956	29.7	966,880

There is to be observed a slight decrease in both of these provinces, and the increase in the Kingdom of Prussia, as the respective tables show, is rather insignificant.

The census of cattle taken in the Government district of Dusseldorf January 10, 1873, resulted in 204,609 head, as against 200,458 January 10, 1883.

The number of cattle in the municipal district of Barmen amounted to 1,065 head in 1873 and to 1,322 in 1883, and in the municipal district of Elberfeld to 1,120 in 1873 and to 1,587 in 1883. The number of households owning cattle in the Kingdom of Prussia amounted to 3,124,046 in 1883 as against 2,977,953 in 1873.

CATTLE CENSUS OF EUROPE.

The following table exhibits a synopsis of the stock of cattle in the several principal European states, with the exception of Turkey:

Countries.	Aggregate number.	Number to a German square mile.	Countries.	Aggregate number.	Number to a German square mile.
Great Britain	6,125,491	1,412	France	11,284,414	1,475
Ireland	4,118,113	2,691	Portugal	528,474	329
Norway	950,000	165	Spain	2,901,508	320
Sweden	2,103,319	284	Italy	3,480,125	614
Russia	22,770,000	214	Switzerland	993,291	1,327
German Empire	15,776,702	1,600	Austria	7,425,212	1,362
Denmark	1,238,898	1,784	Hungary	5,279,193	897
Netherlands	1,377,002	2,309	Greece	109,904	121
Belgium	1,242,445	2,322			

CLIMATE AND TEMPERATURE OF BARMEN.

As to the climate and temperature of Barmen the following is referred to. The calculation is based on the system of Celsius: Altitude, 154.8; mean temperature, 7.3°; in January, 1.2°; in July, 13.7°. The foregoing calculation is the result of twenty-three years' observation. The rainfall averaged 700^{mm} per annum.

CATTLE SLAUGHTERING IN GERMANY.

Since the communication by railroads and steamboats has become so extensive and so universal, the transportation of live stock for slaughtering purposes has attained enormous proportions, and the cattle markets of old have given way to large stock-yards, and in nearly all the large

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125,212	1,362
279,193	897
109,904	121

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cities private slaughtering rooms have been replaced by common slaughter-houses which are generally attached to the stock-yards for the accommodation of the butchers. The central stock-yards in Berlin are the largest and most frequented in Germany, and form, in fact, the central point of cattle dealing for North and Middle Germany. They are as extensive and as well provided with all the modern improvements and accommodations as the Chicago stock-yards. The principal cattle market in these yards takes place every Monday, and on that day 35,000 head of live stock change hands on the average.

There are similar stock-yards in several other German cities, as, for instance, in Breslau, Magdeburg, Nuremberg, Wurzburg, Stuttgart, &c., and all these stock-yards are connected with the railroad depots by special tracks which enable the direct transport of cattle to these establishments. The stock-yards in Elberfeld, which have been opened June 16, 1879, supply the densely populated Berg-Markish territory with most of the slaughtering cattle. There is also a slaughter-house attached to these yards.

ELBERFELD ABATTOIR.

The following two exhibits embrace the number of animals slaughtered at the Elberfeld abattoir within the period from June 16, 1879, to October 1, 1883. In the first exhibit the so-called grand cattle is divided into two species, viz, oxen or steers having a live weight of 400 kilograms or more; (2) cows or heifers. At the beginning of this year slaughtering-cattle were divided into four classes, as will be seen in the second exhibit, viz:

(1) Oxen or steers, having a live weight of 400 kilograms; (2) cows, having a live weight of more than 400 kilograms; (3) cattle, having a live weight from 250 to 400 kilograms; and (4) neat cattle, having a live weight from 130 to 250 kilograms. The first two divisions include the heavier, the third the lighter, stable and grass fed animals, while the fourth class includes animals of small size, and their meat is almost exclusively used by the hog butchers for making sausages.

EXHIBIT I.

Description.	1879-'80.	1880-'81.	1881-'82.
Oxen or steers, alive, 400 kilograms or more			
Cows or heifers	3,803	6,110	7,007
Calves	3,098	4,188	4,000
Sheep	8,488	11,986	12,599
Hogs, slaughtered, over 35 kilograms	10,534	10,115	10,394
Hogs, slaughtered, up to 35 kilograms	11,388	14,761	14,403
Horses	35	31	57
	123	169	226

EXHIBIT II.

Description.	1882-'83.	Description.	1882-'83.
Oxen or steers, alive, more than 400 kilograms	10,197	Calves	15,842
Cows, alive, more than 400 kilograms	1,952	Sheep	12,987
Cattle, alive, from 250 to 400 kilograms	2,181	Hogs, slaughtered, over 35 kilograms	26,492
Neat cattle, alive, from 130 to 250 kilograms	1,333	Hogs, slaughtered, up to 35 kilograms	68
		Horses	338

* From the above tables it will seen that the number of slaughtered horses is steadily increasing.

The following table gives an inside view into the movements of the stock-yards from June 16, 1879, to October 1, 1883.

Years.	Grand cattle.	Hogs.	Calves.	Sheep.
1879-'80.....	8,522	24,216	9,460	14,377
1880-'81.....	14,111	36,929	14,312	15,021
1881-'82.....	17,386	35,750	16,971	16,068
1882-'83.....	20,371	35,872	12,732	12,300
1883, from April 1 to October 1.....	11,004	15,456	8,282	7,971

The average weight of the slaughtered animals is as follows: Of oxen and steers enumerated in the first column of Exhibit II, 325 kilograms; of cows in the second column, 275 kilograms; of cattle in the third column, 175 kilograms; of neat cattle in fourth column, 75 kilograms; of calves in fifth column, 40 kilograms; of sheep in sixth column 20 kilograms; of hogs in seventh column, 95 kilograms.

All animals slaughtered in the Elberfeld municipal slaughter-house are domestic ones, and nearly all of them are bought at the adjoining stock-yards.

From January to August fattened cattle are brought in by cattle-dealers from the central stock-yards in Berlin, or directly from the large farms in Silesia, Posen, East Prussia, and the landed estates near Magdeburg. The trade in grass-fed cattle lasts from August to January. During this period the market is not well frequented by butchers, as they generally obtain their cattle from the cattle markets in Schwelm, Westphalia, and Neuss, Rhenish Province. The cattle which are brought to the Elberfeld stock-yards during this period come from Holstein, Oldenburg, Hanover, from the pastures on the Ruhr, and the Lower Rhine, and a small part from Holland. Most of the cows and neat cattle are brought in from the provinces of Westphalia and Hanover. Westphalia, Hanover, and Holland furnish most of the calves. Sheep come from the central stock-yards in Berlin, and from Westphalia and the Rhineland. Hogs are brought in from Westphalia, Hanover, Holstein, and Mecklenburg.

Thus it will be seen that the valley of the Wupper must be furnished with live-stock for the dairy and the butcher from different parts of Germany.

PRICES OF CATTLE.

The price for slaughtering-cattle averages, for first quality, from \$119 to \$126.14; for second quality, from \$107.10 to \$114.24; for third quality, from \$90.44 to \$99.96; for fourth quality, from \$76.10 to \$80.92; for cows of first quality, from \$109.48 to \$114.24; of second quality, from \$102.34 to \$109.48; of third quality, from \$90.44 to \$97.58.

It may be stated in this connection that in Germany and throughout Europe cattle for slaughtering are not sold by the live weight, as it is done in the United States. There is, however, a lively agitation going on in England and on the continent to imitate the United States in this respect and to introduce this rational and practical method.

CATTLE-INSURANCE COMPANIES.

State and local cattle-insurance companies, both based on terms of reciprocity of their members, work hand in hand and alongside of each

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other. These insurance societies are very numerous throughout Germany, and redound principally to the benefit of small farmers, and, on the whole, are managed very economically. The average premium on the insurance policy is 3 per cent., and the amount of compensation for animals that have to be butchered on account of accidental injuries, or that have died, averages 75 per cent. The animal goes into the possession of the insurance company. Is the injured animal still fit for the slaughter-house, it will then be sold to a butcher at a low price. When the animal has died, only the hide can be utilized, and the carcass is utilized for fertilizing purposes. The insurance system has developed to a high degree in the Government district of Dusseldorf. The different cattle-insurance societies within this district numbered 6,623 members, the insured animals of the bovine race 14,519, and the amount for which animals were insured was 2,889,862 marks, and the premium paid in reached the sum of 88,767 marks in the year 1882.

IMPORTATION OF AMERICAN BEEF CATTLE INTO GERMANY.

In view of the fact that the consumption of beef meat is proportionately increasing in the ratio to the annual increase of the population in Germany, and in the face of the comparatively high price of beef cattle, it may be worth while for American stock breeders and exporters to seriously consider the question whether the importation of American beef cattle into Germany would not eventually turn out to be profitable. The stock cattle, independent of milch cows and oxen, is continually increasing in the United States. It has increased from 1870 to 1880 about 66 per cent., and the aggregate number of stock cattle in the United States, will, at this writing, probably not fall below 27,500,000, while its increase in Germany is very slow and out of proportion to the increase of population. German stock-raisers are even now somewhat alarmed at the prospect that American cattle-breeders may import large quantities of beef cattle into Germany in the near future, as a start has lately been made by importing lean cattle to Schleswig-Holstein, where they were fattened for the market, and the venture has proved to be satisfactory. The import duty for steers and cows is \$1.42½ per head; for oxen, \$4.76 per head, and for young cattle up to two and a half years old 95½ cents per head. In consideration of all these facts the time may not be very distant when the United States will add a new article to its German export list and that, as soon as the requisite dispositions for the safety of the animals will have been completed on board the steamships, American beef cattle may be landed at German sea-ports, and the German laboring classes, on whose tables good and substantial beef meat is quite a rarity, may be supplied with cheap and wholesome American beef.

WOLFGANG SCHOENLE,
Consul.

UNITED STATES CONSULATE,
Barmen, November 23, 1883.

CATTLE BREEDS OF GERMANY.

REPORT BY COMMERCIAL AGENT WAMER, OF DUSSELDORF.

The different breeds of cattle in Germany may be divided into three heads, the lowland breeds, the mountainous breeds, and the middle breeds.

For milk-producing, cattle are cultivated in Germany, (a) in the lowlands (plains, marshes, &c.), with good soil and stable feeding, the Dutch breed, and (b) in the mountainous and rocky regions, where the soil is heavy, the Simmenthal, the Montafun (Swiss breeds), and the Algau (from the Algau, in Bavaria) breeds. The object of cattle-breeding in Germany is chiefly for milk, butter, beef, and labor. There is comparatively little cheese made here; it is imported mostly from Holland and Switzerland.

THE DUTCH BREED.

The Dutch breed (Fig. 1) is very largely cultivated in the districts of Cleve and Rees, on the boundaries of Holland, Regierungs-Bezirk Dusseldorf, and in the lowlands of Lower Rhineland (Nieder-Rheinland). This cow belongs by nature to lowlands of a moist and marshy character and where there is much green vegetation. It has a small and long head; horns short and projecting over the forehead, with the points turned a little upwards; mouth sharp; neck thin and long, with scarcely any dew-lap; the body is long and big, with an even back; feet high; skin tender; color black and white, red or brown and white, gray and white, white or black, and mostly spotted. The cows are not beautiful, but they produce large quantities of milk, breed heavy calves, good working oxen, and are also fine meat. In this immediate neighborhood (Dusseldorf) they are mostly kept in stables, and the one I visited a few days ago contained forty head.* The proprietor informed me that the average yield of milk for each cow was from 14 to 15 liters† per day. One Oldenburg cow amongst the lot was pointed out to me as giving 25 to 30 liters per day. Live weight of the Dutch cow is from 650 to 750 kilograms, and the market value here is from 400 to 600 marks (1 mark is equal to about 23.8 cents American money). In consequence of this breed of cattle being easy to get accustomed to strange climates and the wonderful capacity of the cows for producing milk they are kept in the neighborhood of large cities. Fine and valuable breeds are obtained by crossing them with other breeds. The celebrated Durham cow is a cross breed from the Dutch cow.

SIMMENTHAL BREED.

Simmenthal lies between Stockhorn and Niesen, near Thun, in Switzerland. This valley abounds in fertile fields and luxuriant pastures extending high up on the slopes of these mountains. It is divided by a rivulet, the Simme, and furnishes the celebrated yellowish-red spotted cattle of the canton Bern, which have been most frequently imported to cross with the native cattle of Southern Germany. The middle breeds produced from the crossing are said to be very excellent cattle. In Switzerland the prices remain high, and the inquiry this year (1883) has

* The average daily cost of food for each cow amounted to about 35 cents.

† Liter — one quart.

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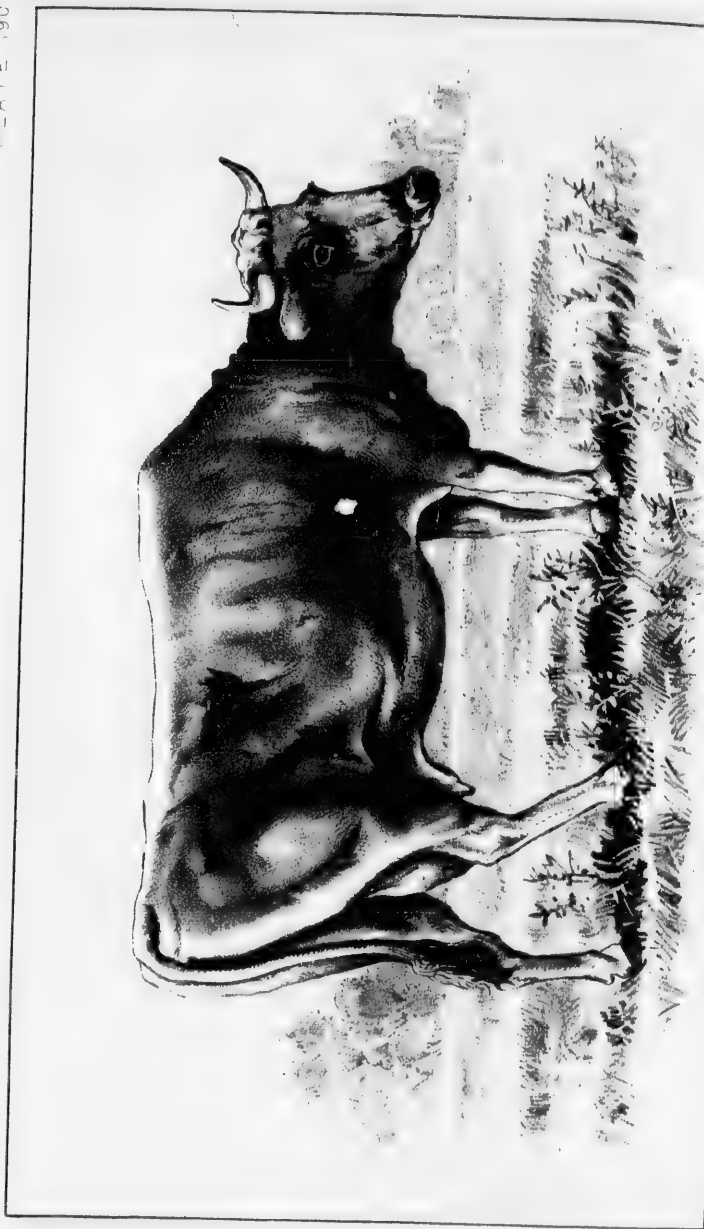
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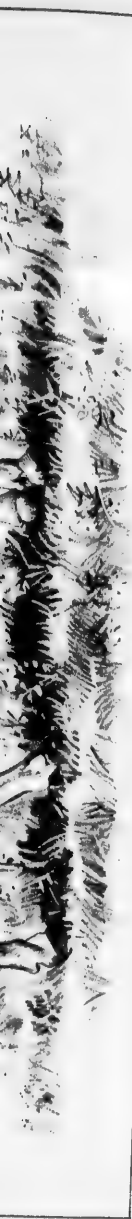
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been on the increase. Particularly in the Simmenthal* the demand exceeds the supply. The live weight of a Simmenthal cow ranges from 600 to 750 kilograms (Fig. 2). The oxen vary from 900 to 1,000 kilograms. Milk of the Simmenthal cows is sweet and contains much fat.

SWISS OR RIGI BREED.

The cattle of the Swiss or Rigi race are very large and heavy; live weight, from 750 to 800 kilograms. The muscles and bones are heavy and strong, and the body in general well developed. Color is dark-brown to light gray, with light yellow about the belly. This breed requires much food and is hard to get accustomed to strange climates.

MONTAFUN BREED.

Next to the Simmenthal in importance is the Montafun Valley. It lies south of Bludenz, in Tyrol, and is about 50 miles long, is very populous, and has rich pastures. The lower parts of the valley are watered by the river Ill. The fields yield summer wheat, rye, barley, oats, potatoes, and flax. Labor is done in the fields entirely with the spade, and even the wagons used on these farms are drawn by human hands.

The Montafun cow (Fig. 3) belongs also to the heavy race. The live weight is from 450 to 500 kilograms. The oxen are proportionally large and heavy. A still heavier breed is obtained by crossing it with the Rigi breed. The bones of the Montafun cattle are strong and of middling sizes, color similar to the Rigi breed, mouth, ears, and back being a little lighter. A dark-brown color is preferred. The head is large and broad, horns white at the base and changing to black towards the ends, neck of medium size, with a large dew-lap. The limbs are well formed, udder large, and indicating a good supply of milk. With good feeding each cow will yield 2,000 to 2,500 liters of milk yearly, which, owing to its richness in fat, is used chiefly for making butter and cheese. Owing to the superiority of this breed the cattle are frequently exported. There is an annual market at Schruns (1,956 feet above the level of the sea) in September, and the cows bring an average of 150 to 240 marks a head. The sale, though, of the better specimens of these cows, is said to have somewhat impaired the home breed.

ALGAU BREED.

This breed comes from the Algaun Mountains, in Wurtemberg and Bavaria. (Fig. 4.) The cows are a little smaller than the Montafun breed, but they are quite distinguished in Wurtemberg, Bavaria, and Saxony for giving large yields of milk that contain much fatty substance. In fact, the Algaun cows of Saxony are said to surpass all other breeds there for producing milk, as the following figures of the comparative quantities of milk will show:

Native cows	Cans.†
Oldenburg	23.16
Amsterdam	24.25
Algaun‡	25.56
	27.38

*It is said that the best cheese is made upon pastures 3,000 feet above the level of the sea, in the vales of Simme and Saanen, and in the Emmenthal. The best cows there yield in summer between 20 and 40 pounds of milk daily, and each cow produces by the end of the season of four months 2 hundred-weight of cheese.

†A Dresden can is equal to 0.933 liter.

‡About 12 cans of the milk of the Algaun cow are required to give 1 pound of butter, while there are 14 cans of milk necessary from the Dutch cow.

Live weight of Algau cow is from 400 to 450 kilograms. Those I saw a few days ago in a stable here were said to weigh as much as 500 to 600 kilograms. They are also excellent for labor and fattening.

A good Algau cow will yield 2,500 to 2,800 cans of milk yearly, which is only a little less than the best Holland cows are capable of producing. The trade in these cattle is pretty lively, and the market is held at Southofen (2,249 feet above the sea-level) in the middle of September and at the end of October. The first is the most important.

The Algau breed is very widely distributed over Germany. Excellent breeds of cattle are to be found all over Germany, principally in Wurtemberg, Bavaria, Thuringia, Rhineland, and Schleswig-Holstein, which may be classified as follows:

- I.—*Wurtemberg*: (1) Alb, (2) Teck, (3) Neckar, (4) Schwäbisch Hall, (5) Limburg.
 II.—*Bavaria, Thuringia, and Rhineland*: (a) (1) Upper Main, (2) Itz Main, (3) Oxenfurth, (4) Scheinfeld. (b) (1) Glau (river Glau), Fig. 6, (2) Donnersberg, (3) Birkensfeld. (c) *Native Bavarian cattle*: (1) Miesbach, (2) Kollheim, (3) Spesshardt, (4) Rohn Mountain. (d) *Hessen Nassau*: (1) Vogelsberg, (2) Westerwald.
 III.—*Schleswig-Holstein*: Marshland: (1) Eiderstedt, (2) Ditmarsh, (3) Breitenberg, (4) Wilstermarsh. Alluvial soil: (1) Angel, (2) Tondern.

FATTENING CATTLE IN GERMANY.

Beet-root food.—A great source of agricultural economy to Germany is the culture of the beet-root. Here it has not only proven valuable in the manufacture of sugar, but also for fattening cattle, and dairymen estimate it very highly for feeding purposes. The pressed beets from the factories (*i. e.*, the residue left after the juice has been removed) furnish also highly nutritious materials for food. For all practical purposes the nourishing value of this residue may be estimated in proportion to the amount of protine or nitrogenous substances it contains. In general there is in every 100 parts of the fresh or 30 parts of the dried substance 2 parts albuminoids, 18 parts non-nitrogenous matter, 6 per cent. pure fiber, and 3.4 per cent. ash; the fat may be reckoned as 2 per cent.

According to an analysis by Gohren, pressed beets contain:

	Per cent.
Water	73.668
Ash	1.544
Albuminoids	1.599
Carbohydrates	18.383
Fiber	4.575
Fat	.291
Nutritive value, 1: 12.4.	

Heidepriew gives as the results of his analyses of the clean ash of the residue from three different factories, the following figures:

Constituents.	(a)	(b)	(c)
Potash	35.88	20.84	30.76
Soda	6.31	12.34	4.93
Lime	11.59	26.71	21.58
Magnesia	7.96	22.27	4.28
Oxide of Iron	3.63	0.96	3.19
Phosphoric acid	5.28	7.43	4.92
Sulphuric acid	1.88	2.91	2.22
Silica	20.97	4.76	25.23
Chlorine	1.54	0.71	1.54

* These cattle are very largely exported to England for beef.

lograms. Those I weigh as much as for labor and fattening. milk yearly, which is able of producing. market is held at middle of September important.

Germany. Excellent, principally in Schleswig-Holstein,

h Hall, (5) Limburg. (2) Itz Main, (3) Okenndersberg, (3) Birkenwald, (3) Spesshardt, (4) Breitenmarsh, (3) Breiten-

onomy to Germany is proven valuable for tle, and dairymen pressed beets from (green removed) furnish all practical purposes in proportions it contains. For 30 parts of the nitrogenous matter, may be reckoned

contain :

	Per cent.
.....	73.688
.....	1.544
.....	1.599
.....	18.383
.....	4.575
.....	.221

the clean ash of the figures :

	(a)	(b)	(c)
..	35.88	20.84	30.76
..	6.31	12.34	4.93
..	11.59	26.71	21.58
..	7.96	22.27	4.28
..	3.63	0.96	3.19
..	5.28	7.43	4.92
..	1.88	2.91	2.22
..	20.97	4.76	25.23
..	1.54	0.71	1.54

for beef.



Julius Rosen & Co. Inc.

PLATE 191

HAVARIAN WORKING CAPITAL

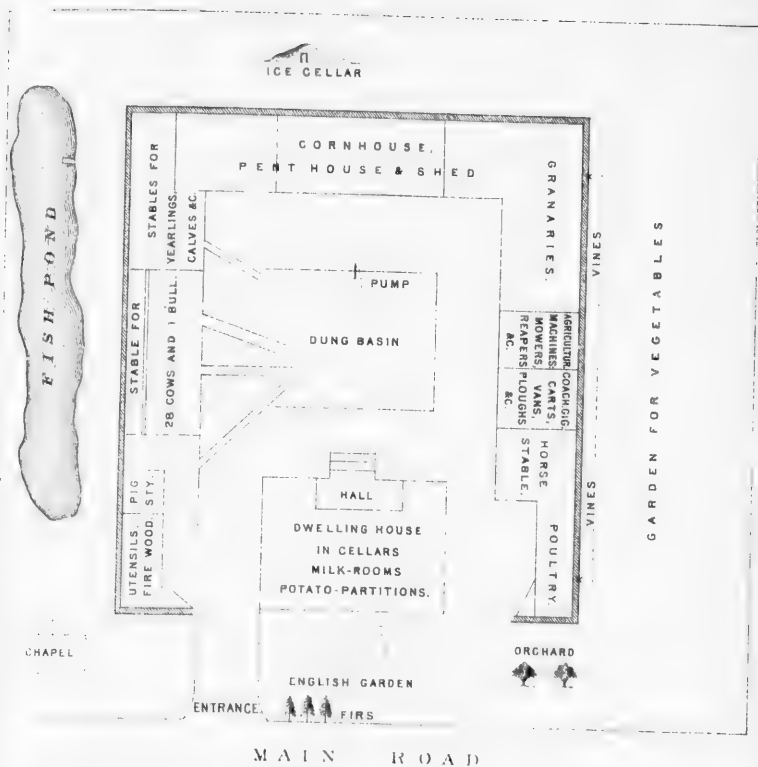
—Jesse Fleet Co., Ltd.



BAVARIAN WORKING GAIL

From Plate 17, 1885





SKETCH OF A FARMHOUSE AND SURROUNDINGS,

ON THE DECLIVITY OF THE "SEVEN MOUNTAINS",

ABOUT 6 ENGLISH MILES DISTANT FROM THE RHINE

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When sugar-beet residue is covered in pits for safe-keeping, and to likewise increase its digestible value, there takes place very shortly afterwards, with a rapid rising of temperature, a lively fermentation, and alcohol and acetic acid and lactic acid and ammonia are formed. The so-formed acid residue may be preserved for a long time.

The chief constituents of this acid residue, as determined by Professor Maecker, are as follows: Water, 75.54 per cent.; dried substance, 24.46 per cent.; nitrogen in dried substance, 1.22, in the fresh, 0.03 per cent. In the fresh and dried substance there are contained, respectively, 2.573 per cent. and 10.519 per cent. albuminoids.

Cotton-seed cake: Of the latterly imported food stuffs into Germany for animals, that of cotton-seed cake stands very high as a valuable material for fattening cattle, owing to its containing much albumen (40 to 50 per cent.) and a considerable amount of fat (10 to 20 per cent.).

STATISTICS OF OX FATTENING.

The following table of calculations on the fattening of oxen have been furnished by Mr. Valentine Pfeifer, the proprietor of a cattle farm in the Rhenish Province, who has continually in his stables about forty head of oxen of the Alsatian and Glau breeds, they being considered here the best for labor and fattening. The manure is removed from the stables at intervals of every three and four months, the racks being so arranged that they can be raised in proportion to the accumulation of the manure. The food consists of beet-root residue, chaff, hay, oil cake, and wheat clover (Weizen Klee). They are fed three times daily. Duration of labor of the oxen is limited to two years. Afterwards they are turned over to the fattening stables (Maststall). According to the books kept the fattening lasts about forty-four days.

Six oxen fed with various quantities of the above food by Mr. Pfeiffer for fattening:

Weight on the 10th of March: (1) 1,040 pounds; (2) 1,080 pounds; (3) 1,225 pounds; (4) 1,145 pounds; (5) 1,200 pounds; (6) 1,210 pounds.

They were put up for fattening on the 5th of September, and showed the following progress:

Date.	1.	2.	3.	4.	5.	6.
	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.
September 5.....	1,403	1,408	1,245	1,220	1,410	1,393
September 12.....	1,420	1,425	1,283	1,245	1,450	1,398
September 19.....	1,460	1,415	1,300	1,250	1,450	1,400
September 26.....	1,460	1,435	1,310	1,263	1,425	1,390
October 3.....	1,456	1,435	1,330	1,245		1,370

PRICES OF GERMAN CATTLE.

The last market report for this fall, published by reliable authority, states, among other facts—

The position of our northern land owners has not exactly improved, and many of them are necessarily forced to reduce their expenses as much as possible.

In the lowlands of Northwestern Germany heifers of first quality bring \$100 to \$105; calves, born in February and March, \$32 to \$36; good bulls, \$120 to \$143. In the Angel district (Schleswig Holstein) there are paid for heifers of first quality \$70 to \$86. Older cows for milking off, \$54 to \$60. Denmark is, in these parts, the best purchaser.

The prices in Switzerland remain also high. In the valley of Simmen the demand exceeds the supply. In Bavaria the trade is likewise lively. The Voigtland, red-breed cattle, are in good demand, especially for labor.

Since the natural fertility of the lands of Germany has long become more or less exhausted, the question of manure must be viewed as of the greatest importance, and the state of cattle-breeding may be accepted as a good scale by which the prosperity of the agriculture in the country is to be estimated. In those parts of the country where there is much cattle-breeding the highest standard of agriculture exists.

WM. D. WAMER,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Dusseldorf, November 3, 1883.

CATTLE IN PRUSSIA.

REPORT BY CONSUL-GENERAL BREWER, OF BERLIN.

STATISTICS RELATING TO CATTLE IN GERMANY.

In compliance with circular instruction of July 18, 1883, I have now the honor to submit a report respecting cattle in Prussia.

It has not been possible for me to obtain official information relating to all the points mentioned in the circular, and it was only with the greatest difficulty that the tables inclosed were obtained from private sources. A great deal of literature on the subject-matter is extant in Germany, and every point respecting breeding, treatment, and the physiology of the various breeds has been thoroughly discussed by men who have made the subject a special study for years, and whose opinions are entitled to respect. The result of their researches and investigations, as given to the world respecting cattle and cattle-raising, is of the greatest value.

CATTLE CENSUS OF GERMANY.

According to the census of 1883, the increase in the number of cattle since 1873 has been 15 per cent. in many provinces, and as much as 40 per cent. in others.

The greatest number of breeding bulls is found in Mecklenburg, Western Prussia, and the Duchy of Brunswick. About 50 per cent. of the cattle in Germany is in the Kingdom of Prussia, where, in 1873, there were 8,639,514 head, and in 1883, 8,735,559 head.

CATTLE IN EASTERN FRISIA.*

The cows of Eastern Frisia are especially remarkable for the abundance of milk which they yield. These cattle in form and build are heavier even than the Dutch cattle and stronger in the bone. A great many of them are sent to Mecklenburg and Pomerania, where, with ordinary good treatment, great results are obtained. Pasturage in Frisia is good and plentiful, as the majority of breeders devote nearly the

* The report of Consul Wilson, of Bremen, deals at length with Frisian cattle.

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whole of the land to grazing. Although the soil is remarkably fertile but few farmers ever grow grain or even potatoes, preferring to purchase such articles.

There is no doubt but that this course brings more profit, as there is but little expense incurred in raising the cattle and the profits from the sales of breeding and fat cattle are large. All the manure of the cattle is used upon the meadows, and the meadows are alternately mown and pastured. The manure is made most useful, for as soon as it is covered by the after-growth it becomes dissolved and assimilates with the soil and its strength is not destroyed by the sun.

The dairy products are of the most excellent quality, although the quantity is hardly as great as the plentiful pasture would seem to warrant.

The following statement respecting cattle in Eastern Frisia, although not official, is quite reliable, it having been obtained from trustworthy private sources:

Soil: Loamy, sandy.

Average size of cow: Length, 2.55 meters; height, 1.31 meters at wither; height, 1.32 meters at rump.

Feeding: Up to the seventh week sweet milk, mixed with fine hay after first month; buttermilk after eighth week, mixed with oat-meal and barley. In winter, first year, beets, hay, and 4 to 6 liters of barley-meal daily.

Average live weights of steers: Three years, 1,120 pounds; four years, 1,510 pounds; five years, 1,875 pounds; six years, 1,620 pounds; seven years, 1,430 pounds; eight years, 1,520 pounds; nine years, 1,400 pounds; average annual yield of milk of cows, 2,600 quarts.

Cultivated grasses: White clover and ray-grass.

CATTLE IN GRAND DUCHY OF OLDENBURG.

The great dairies around Berlin rely almost entirely for their supply of milk cows upon the cattle bred on the marshy pastures on the coast near the Jahde Bay and the Weser.

The breed differs from the Frisian inasmuch as it shows a heavier head and stronger horns and the buttocks are less broad.

In weight the cattle approach that of the Holland breeds. The live weight of cows will average about 1,200 pounds and that of oxen from 1,500 to 1,800 pounds. The udder in these cows is very largely developed and the yield of milk is considerable, reaching as much as 3,000 quarts a year from well-kept animals.

Like the Frisian breed these cattle require good pasture and also do well with ample stable food. The very best specimens of Oldenburg cattle are found in Budjadingen.

The following statement contains some carefully collected information respecting these cattle:

Cattle in Oldenburg.

Age.	Length.	Height—		Weight.
		At withers.	At rump.	
	<i>Meters.</i>	<i>Meters.</i>	<i>Meters.</i>	<i>Pounds.</i>
2½-year-old steers.....	2.53	1.48	1.56	1,278
4-year-old cow.....	2.13	1.41	1.46	1,100
3-year-old cow.....	2.14	1.43	1.52	986

Soil: Sand; clay.

Average yield of milk: 2,900 to 3,500 quarts per year; $6\frac{1}{2}$ quarts per day; 14 to 16 quarts of milk to 1 pound of butter.

Cultivated grasses: Red clover; ray grass.

Handling products: Butter exported. Cheese made only for domestic use.

Feeding: Calves receive mother's milk two weeks; then skimmed milk and fine hay. At five months they are taken to pasture. Winter feed consists of two-thirds straw, one-third hay, 1 to 3 pounds of oats.

CATTLE IN SCHLESWIG-HOLSTEIN.

In the lower portions of Schleswig-Holstein crossings with English breeds have led to great improvements in cattle, and they are now exported to England in great numbers.

The butter produced here, also largely exported to England, is of an excellent quality, and the refuse from the great dairies is used with advantage for fattening hogs. The breed of cattle raised here form the connecting link between the lowland and highland cattle, and there are eight distinct varieties deriving their names from the several counties of the province. The cattle of Eiderstedt have been crossed with English Shorthorns. The calves receive their mother's milk only during the first few weeks. After two or three weeks, warmed skimmed milk is given them, and they are in a few months taken to pasture. The fattening commences in the third or fourth year, according to their development. The steers then reach a dead weight of from 800 to 1,000 pounds. Many of them are sent to the London markets, where they bring very good prices, whilst others go to Hamburg, from whence the meat, after being smoked, is shipped in great quantities.

The quality and quantity of dairy produce of the Eiderstedt cows are above the average, while those of the county Ditmarsh are rather inferior in their yield of milk. In Wilstermarsh and at Breitenburg, both the cattle for the dairy as well as for slaughter are very superior. Cows between three and four years of age attain a weight of about 900 pounds.

The most remarkable of all the cattle of Schleswig-Holstein are the cattle of Angeln and Tondern. At the age of five or six years the cows of Angeln and Tondern weigh between 800 and 1,000 pounds, and in the most favorable milking time produce daily 9 to 12 quarts of milk, which, by its fatty richness is especially adapted for the production of butter.

Fed plentifully these cows average an annual yield of 3,500 quarts of milk. Full pasture is given from May (after the cows have calved) until the end of October, the cows remaining out day and night. Every field has plenty of water, either in ponds made for the purpose or in large troughs filled from wells.

In the northern parts of Schleswig a breed of cattle is to be found which, although smaller than that of Angeln and Tondern, is remarkable for its magnificent build in the bone as well as for its adaptability for fattening. Being somewhat hardened by the manner of its rearing and its confinement to rather short pasturage, this breed is capable of wonderful improvement. Many are sent to neighboring countries, where they become longer in limb and still coarser in the bone, heavier in the head and horns and less neat in form, but are excellent for slaughter or the dairy.

Stock-breeders in the northwestern portion of our own country have for the last few years imported these cattle for the purpose of improving their own herds. In color these breeds are gray, or of a bluish-black with white spots.

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The following two statements regarding the cattle of Schleswig-Holstein will prove interesting:

Cattle in Schleswig, Comprising Angeln and Tondern.

Description.	Length.	Height—		Weight.
		To withers.	To rump.	
	<i>Meters.</i>	<i>Meters.</i>	<i>Meters.</i>	<i>Pounds.</i>
Steers of from two and one-fourth to three and one-half years.....	2.62	1.36	1.43	880
Cows from three to seven years.....	2.53	1.32	1.39	805 to 890

Soil and temperature: Similar to Holstein, and an extensive growth of hazelnut and blackthorn affords protection to the cattle against high winds.
Average yield of milk: 2,200 to 3,000 quarts milk; very rich and fat; about 10 quarts to 1 pound of butter.

Feeding and housing: Calves intended for rearing are tied up from December to April; from ten days to two weeks they receive mother's milk, after this sweet skimmed milk, of which from 8 to 10 quarts are given. From May until October the cows are pastured, but housed during the cold nights.

Holstein cattle.

Description.	Length.	Height—		Live weight.
		At withers.	At rump.	
	<i>Meters.</i>	<i>Meters.</i>	<i>Meters.</i>	<i>Pounds.</i>
Steer, twenty months old.....	2.51	1.48	1.44	1,220
Steer, three years old.....	2.88	1.48	1.48	1,790
Cows, three years old.....	2.85	1.41	1.46	1,380

Remarks: In the report, the cattle of both Schleswig and Holstein have been grouped under one heading, but in the statistics it has been found necessary to make a division of the two provinces, the basis of the former being the Wiltstermarsh cattle, that of the latter the Angeln and Tondern cattle.

Average yield of milk: 2,600 to 3,500 quarts. Average annual income per cow from butter, cheese, &c., \$70.

Feeding: Calves receive mother's milk two weeks only; in three months they are sent to pasture. Winter feed consists of cut straw, with beets and hay and 3 or 4 pounds of oats.

CATTLE OF DUTCH DESCENT.

The marshy tracts of land situated at the mouth of the Weichsel and Nogat are among the most fertile river lands on the Baltic coast. They form a great delta-shaped plain which extends from Thorn to Dantzie.

In the thirteenth century Dutch colonists brought cattle to this place, from which the breed now reared there sprang. It is, however, by no means equal to the Dutch breed, either in the yield for the dairy or for fattening.

In color great variety is found, ranging from a grayish-red to a spotted black. In cultivating the breed no regard has been paid to anything but producing the largest possible quantity of milk, which is rather watery and obtained at the cost of the strength of the animals.

The yield of milk is estimated at from 15 to 20 quarts a day during the first few months after calving, and an annual yield of from 2,500 to 3,000 quarts.

STATISTICS OF VARIOUS BREEDS.

Statements respecting their herds which I have obtained from several stock-breeders have enabled me to compile the following tables:

Statistics showing results of a five-years' trial of Frisian, Schleswig, and Silesian cattle on a stock-farm in Saxony.

Year.	Schleswig cows.			Frisian cows.			Silesian cows.		
	Average annual yield of milk.	Yield calculated to result from 1 cwt. of hay or its equivalent.		Average annual yield of milk.	Yield calculated to result from 1 cwt. of hay or its equivalent.		Average annual yield of milk.	Yield as calculated to result from 1 cwt. of hay or its equivalent.	
		Milk.	Butter.		Milk.	Butter.		Milk.	Butter.
	<i>Quarts.</i>	<i>Quarts.</i>	<i>Pounds.</i>	<i>Quarts.</i>	<i>Quarts.</i>	<i>Pounds.</i>	<i>Quarts.</i>	<i>Quarts.</i>	<i>Pounds.</i>
1877	2,632	29	2½	3,272	27	2	2,212	22	1½
1878	3,044	30	2½	3,267	27	1½	2,411	24	1½
1879	2,856	28	2½	2,992	24½	1½	2,018	20	1½
1880	2,810	28	2	2,676	22	1	2,303	23	1½
1881	3,050	30	2½	3,132	26	1½	2,635	26	1½

Statistics compiled from examination of various specimens of cattle from several farms in Prussia.

Cattle of Swiss origin.	Length.	Height—		Live weight.
		To withers.	To rump.	
	<i>Meters.</i>	<i>Meters.</i>	<i>Meters.</i>	<i>Pounds.</i>
Stear, 2½ years	2.60	1.51	1.51	1,315
Cow, 7½ years	2.69	1.51	1.51	1,281
Cow, 5 years	2.48	1.37	1.42	1,085
Cow, 8 years	2.59	1.42	1.43	1,233
Cow, 7 years	2.67	1.50	1.56	1,335

*Annual average yield of milk, &c. : 2,560 quarts, of which 100 quarts averaged 8 pounds of butter and 16½ pounds of cheese.
1 meter = 39.37 inches.*

Result of competitive trial of cows of various breeds on the model farm of a landed proprietor in Holstein.

No. of cows.	Name of breed.	Total yield of milk during the year of trial.	Average yield of each.	Average per day of each.	Average yield.	
					Highest.	Lowest.
		<i>Quarts.</i>	<i>Quarts.</i>	<i>Quarts.</i>	<i>Quarts.</i>	<i>Quarts.</i>
3	Oldenburg (from Breitenberg)	8,594	2,865	8	2,946	2,839
4	Oldenburg (from Tondern)	9,337	2,334	6½	2,345	2,020
3	Ayrshire	5,386	1,798	5	2,249	1,415
4	Dutch	14,200	3,550	9½	6,142	2,562
3	Swiss (from Simmenthal)	11,040	3,680	7½	.....	.....
3	Bavarian (from Bayreuth)	11,724	3,908	8	.....	.....

PRUSSIAN PRIZE CATTLE.

I am unable to give the number of different breeds of cattle in Germany, or even in Prussia, or the percentage of cattle belonging to each breed.

ained from several
ing tables :

ig, and Silesian cattle

Silesian cows.

	Yield as calculated to result from 1 cwt. of hay or its equivalent.	Milk.		Butter.
		Quarts.	Pounds.	
arts.				
213	22		11	
411	24		11	
018	20		11	
303	23		11	
635	26		11	

from several farms in

Height—	Live weight.	
	To rump.	
s.	Meters.	Pounds.
51	1.51	1,315
37	1.42	1,281
42	1.43	1,085
50	1.56	1,233
		1,335

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Julius Ben & Co. Leipzig

POMERANIAN PRIZE BULL "BLONDIN"

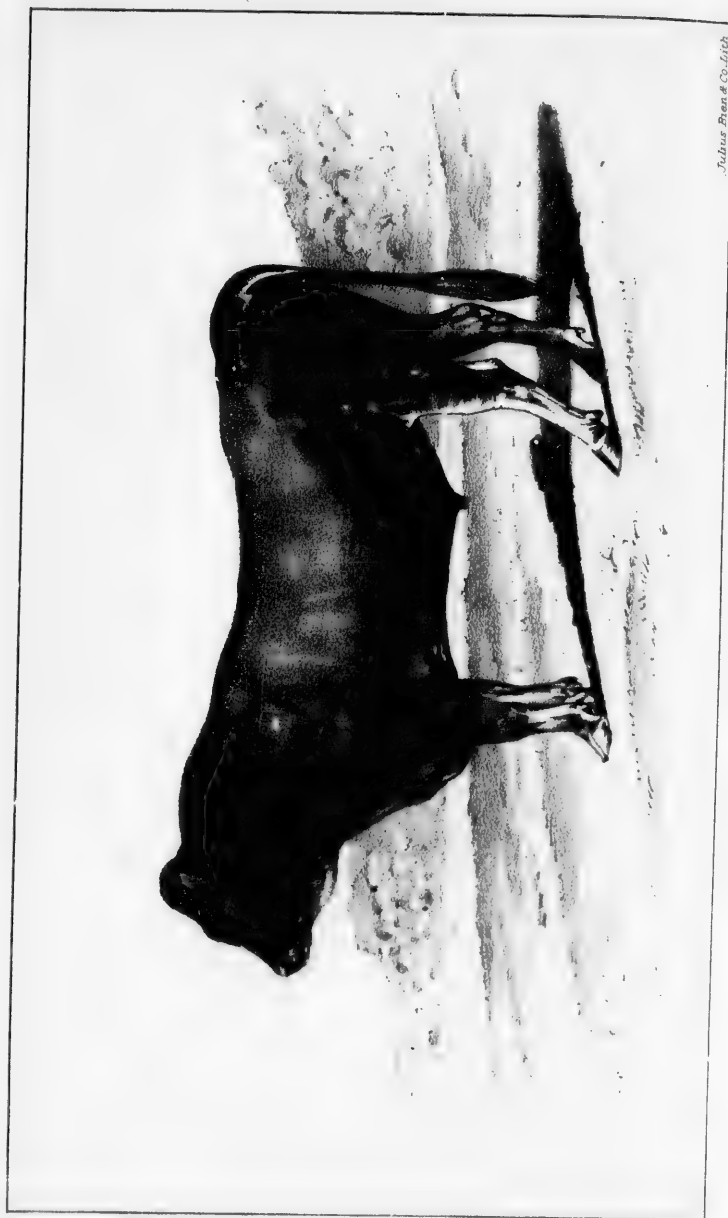
POMERANIAN PRIZE BULL "BLONDIN"



BAVARIAN PRIZE COW

— Colman, Printer, & Co., London

BAVARIAN PRIZE COW



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ANGELER PRIZE COW

ANGELER PRIZE COW

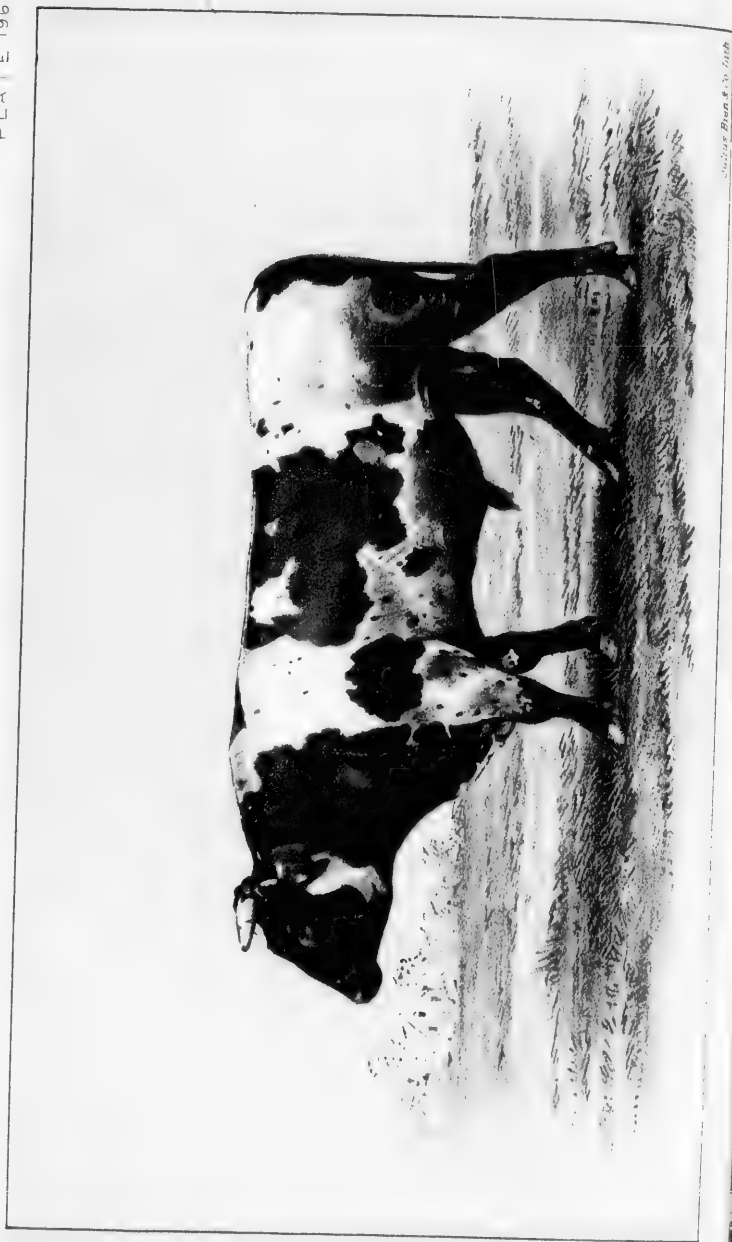




ANGELER PRIZE BULL "THOMAS"

ANGELER PRIZE BULL "THOMAS"

PLATE 196



Charles B. Smith & Co. Lith.





Julius Ben & Co. Lith

WILSTERMARSCH PRIZE COW "LEANDA"

WILSTERMARSCH PRIZE COW "LEANDA"





WILSTERMARSCH PRIZE BULL NEPTUNI

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I am informed that at the agricultural department here a census has been taken during the present year by which this information will be given, but as the report has not yet been made public the department declines to supply me with the required information. From my own investigation I am led to believe that the different breeds of cattle in Germany have not been kept as separate and pure as in our own country, but have been so crossed that but comparatively few herds remain in their original purity.

But comparatively few cattle are raised in the immediate neighborhood of this city, as the province of Brandenburg, in which Berlin is situated, is not well adapted for grazing purposes, the surface being level and the soil light and sandy.

Exhibits A,* hereto annexed, are photographs of an East Frisian bull and cow; Exhibits B,* of an Oldenburg bull and cow; Exhibits C, of a Wilstermarsch bull and cow; Exhibits D, of a Breitenburg bull; Exhibits E, of an Angeln bull and cow; Exhibits F, of a Bavarian bull and cow; and Exhibit G, of a Pomeranian bull.

These cattle were all exhibited and received prizes at the late Hamburg Exhibition.

M. S. BREWER,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
Berlin, December 27, 1883.

CATTLE IN OLDENBURG, JEVERLAND, AND EAST FRIESLAND.

REPORT BY CONSUL WILSON, OF BREMEN.

INTRODUCTORY.

In answer to circular letter under date of July 18, 1883, desiring certain information regarding the breeding and raising of cattle in this consular district, I have the honor to submit the following report:

This industry is principally carried on in the Duchy of Oldenburg, Jeverland, and East Friesland, and is the chief employment of the farmers. Cattle raised in other parts of this consular district are similar to the Oldenburg or Budjadinger breed, but not of such pure blood.

I am indebted to Mr. John G. Gross, consular agent for the Grand Duchy of Oldenburg, Jeverland, and East Friesland, for the following valuable information, obtained by him by visiting various parts of his agency and the farms of the principal breeders and raisers of this justly celebrated breed of cattle, and conversing with them and with the public officials who are interested in this business.

SOIL AND CLIMATE.

Before entering into particulars concerning the breeding of cattle in the Duchy of Oldenburg, Jeverland, and East Friesland it is necessary to give a general description of the soil and climate of this district, which contains about 8,395 square kilometers, with about 530,000 inhabitants.

The soil must be divided in two parts, each entirely different from the other. One part is called the marsh or marshes, and stretches along

* See report by Consul Wilson, of Bremen, for duplicates of Exhibits A and B— an East Frisian bull and cow and an Oldenburg bull and cow.

the coast of the North Sea from Holland to Schleswig-Holstein, and is formed by the deposits of the sea and the different rivers flowing into it. The other part is called the Geest or Geestland, composed of sand and bog of a very light nature. The cattle bred on this soil, of course, are of a lighter nature, but nevertheless good milkers, as is shown hereafter.

The marsh-land may be divided into three different regions, viz:

(a) The region of the alluvium outside of the dikes or dams, which is more exposed and is overflowed by high tides.

(b) The region of the old pastures, grazing land, and that used for tillage, all of which are protected by high dikes or dams against high tides.

(c) The region of the mixed marsh-land, that is to say, clayish sand, the transition from heavy clay to lighter soil.

It is natural, therefore, that the quality of the soil in the marshes must be a very different, and that with the change of the soil the weight of the cattle corresponds, while beauty of the form depends less on the nature of the soil, but more or less, if not entirely, upon the intelligence of the breeders.

The Geestland is diluvium and consists of a light sandy soil peculiar to the plains of North Germany, in which sand, bog, or moor prevails; in some places loam covers the soil, which in general is greatly in want of lime, as without it or good marl the cultivation of the better or more profitable sorts of herbage for fodder is very limited, and for this reason the breeding of heavy cattle is limited in the same manner. While the marsh is entirely cultivated, only 60 per cent. of the Geestland is cultivated, the rest being barren or uncultivated heather or bog.

TILLAGE AND GRAZING LANDS.

The following table will show how the farmers in the Duchy of Oldenburg make use of their land; also in what manner cattle-breeding is dependent on the quality of the different soils:

Territory or soil.	In use for tillage and gardeners.	For pastures.	For mowing purposes.	Total area in use.
	<i>Hectares.*</i>	<i>Hectares.</i>	<i>Hectares.</i>	<i>Hectares.</i>
Marsh.....	31,180	46,750	25,115	103,045
Geestland.....	191,492	23,077	37,020	162,399
Total.....	132,582	69,827	62,035	265,444

* 1 hectare = 2.471 acres.

Number of cattle.

Territory or soil.	Total number—				Number of cattle on every 100 hectares of area.			
	Horses.	Cattle.	Pigs.	Sheep.	Horses.	Cattle.	Pigs.	Sheep.
Marsh.....	12,920	79,655	12,768	18,830	12.500	77.09	12.306	18.202
Geestland.....	15,638	94,128	67,487	130,118	9.206	55.704	39.406	77.05
Total.....	28,558	173,783	80,255	148,948				

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The preponderance of cattle-breeding in the marshland is evident, and the quality of the race for milking, breeding, and slaughtering purposes so far exceeds the races in the Geestlands that it is not necessary to enter into more particular details than is shown in the annexed tables of these latter races, they being of too inferior quality to improve the breed in the United States.

According to a statement made by the director of the statistical department at Oldenburg, the comparative value of the cattle raised in the Weser marshes, classed in the three groups hereinbefore mentioned, may be stated to amount per metric square mile of cultivated land for Class A, from \$37,750 to \$45,000; Class B, from \$30,000 to \$37,750; Class C, from \$22,500 to \$30,000; whilst the value of the cattle raised on the Geestlands amount only for first class land, from \$18,500 to \$22,000; for second class land, from \$14,500 to \$18,000 for third class land, from \$7,000 to \$12,000 or 14,000 per metric square mile.

The better the soil the larger is the number of horses and cattle kept thereon in the marshes, whilst in the Geestlands sheep are prominent, next agriculture and peat digging.

Nearly all farmers in the marshes are proprietors of the land they use; nameable nobility, abounding in other parts of Germany, does not exist there, therefore larger estates than from 8 to 40 hectares in the marshes and from 15 to 60 hectares in the Geestlands are but seldom met with.

CATTLE AND CATTLE-BREEDING IN THE MARSHES.

The foregoing appears necessary to the understanding of the following:

For the promotion of cattle-breeding in the district of the marshes several institutions have been established; the principal are:

(1) The selection of bulls for covering purposes by delegates of the interested farmers, veterinary surgeons, and some Government officials.

(2) The institution of the herd-book, keeping a pedigree of bulls and cows selected for registry.

(3) The different cattle shows.

Selection of bulls.—I have to remark that only such bulls may be used for covering purposes as have been selected by this commission, which, in general, is appointed by breeders and graziers in every district of the public administration. For the best bulls premiums are granted by the Government amounting to from \$50 to \$75 per head, according to the form and the breed. This system, in general, enjoys the approval of the farmers and breeders, as it guarantees that their cows are only to be covered by well-formed and well-conditioned bulls.

Herd-books.—The institution of the herd-book, although introduced here only a few years ago, has served greatly to improve the breed of the cattle; the register it contains gives the breeders a clear insight into what effect they may obtain in strict pure breeding of selected cattle. The first section of the statutes point out the exact aim which the breeding has to obtain; therefore the different animals are selected by a commission which may in no instance deviate from this rule. The institution of the herd-book has only been in use here for five years; in East Friesland it is to be introduced soon. In the marshes of the duchy were registered 1,195 head of cattle; in the Geestlands, 819; total, 2,014 head.

Cattle shows.—This institution, imported from England, meets here with great approbation, and has developed itself since 1836 (when the first cattle show was held near Brake) very favorably, so that now in nearly every district of the marshes annual cattle shows take place, which serve greatly to improve, by comparing the result of the different breeds, and the manner of breeding in the different districts.

The cattle in the duchy and East Friesland may be divided into—

- (a) Cattle raised on the marshes of the river Weser.
- (b) Those raised in Jeverland.
- (c) Those raised in East Friesland.
- (d) Those raised in Geestlands.

(a) The marshes on the river Weser embrace the district of Brake, Budjadingen, and Elsfleth, bounded on the north and northeast by the North Sea, on the east by the river Weser, and on the west by the river Jade. The cattle raised in these districts are called in the interior the Oldenburg or Budjadinger race, and are in great demand for breeding purposes nearly everywhere. Although the cattle are more or less related to the races raised in Holland and East Friesland, they possess distinct marks which characterize their origin. The head, for example, does not agree with the Holland breed; the forehead, the cheeks, and the parts of the mouth are broader, and the head is shorter; the mouth shows a dark, but not black pigment; the palate roof of the mouth shows the same; the horns of most animals are short with an outward curve, and sometimes on young animals are rather strongly developed; the formation of the forepart of the body shows also a difference with the Holland breed, falsely called in the United States the Holstein breed.

Whilst the pure Holland breed shows a back view which promise good milkers, the breeders thereof appear to have overlooked the development of the fore parts, whereas the cattle in the marshes show a wide and deep breast, well formed, close shoulders and broad withers, with ribs, which, since the introduction of the herd-book, take more and more the round barrel-form; the backbone appears long to satisfaction, and shows in its construction good formation of kidneys and hips, and very seldom now shows an inclination of curving downwards (hollow back); the croup or hind quarter between the hips corresponds with type peculiar to the cattle of the marshes, but sometimes might be longer; by careful breeding the root of the tail has greatly improved in its situation; formerly showing a more or less tendency to be prominent, it now hardly raises above the straight backbone line; the shanks of a good cow of the marshes present themselves full fleshed, and the flesh between the shanks sinks sufficiently deep.

The fat cattle in the Weser marshes never prove delusive in their weight, in general they deliver larger weight than they promise while living. The udder and milk-tokens are in most all cases well developed, and are never known to deceive; wherefore the cow of the marshes may be put down as a good milker, the particulars of which will be shown in the table annexed.

The district in which the Jeverland race is bred embraces the district of Jeverland on the left bank of the river Jade; its boundaries are: on the north, the North Sea; on the west, East Friesland; on the south, the district of Varel; and on the east, the river Jade. The cattle produce of this district embraces dairy products, rearing calves for breeding purposes, and fattening for slaughtering. In their whole appearance these cattle show in a much larger degree than the Budjadinger cattle their near relation to the cattle raised in the north part of Holland. The

head, in proportion to the mouth in a conical form; the ears are small and are black. The of a fine skeleton the race raised in the marshes, the aim of the East Friesland breed, or county marshes, by the river Jade, by Jeverland, Osnabrück. The rivers the marshes, the interior corner. I only mention the bog and sand in this report. in Jeverland, at 10 per cent. for the which are in Germany—to Saxony good prices. The in the Weser marshes they show the good color of the 20 per cent. red, more certain; the ago the institution ever, find the same, however, try north of Holland number of cattle amounted, horse

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head, in proportion to its breadth, is somewhat longer; the pigment of the mouth in general of black color; the horns are fine and of a cylindrical form; the form of the neck corresponds with the form in the other marshes. The expansion of the breast, and the firmness of the shoulders, however, do not reach that of the cattle in the Weser marsh. The form of the ribs is more flat; nevertheless the total impression of the fore parts of the trunk or body is satisfying, showing that breeders know what they aim at; the hind quarter in all its parts is well developed; a trifling curving or sinking of the backbone before the croup is sometimes met with as well as a faulty elevation or situation of the root of the tail; the color is, in general, with only a few exceptions, black and white, four white legs, the tail half black and white, with a small white star on the forehead; the eyelids and the exterior part of ears are black. The milk-tokens must be called excellent. This race boasts of a fine skeleton, fine skin and hair, but in general it is not so heavy as the race raised in Holstein. The Jeverland race may be called excellent milkers, easily fed, with corresponding capability to be fattened. The aim of the breeders here in general is to get good milkers.

The East Frisian race is reared solely in the district of the Landdrostey, or county of Aurich, which is bound on the north, as are all the marshes, by the North Sea, on the west by North Holland, on the east by Jeverland, and on the south by the district of the Landdrostey, Osnabruck. This country contains only on the sides of the sea and rivers the marshland mentioned before, whilst the land lying more in the interior consists of bog and sand.

I only mention here the cattle produce of the marshes, as those on the bog and sand lands are too small and insignificant to be mentioned in this report. The production of cattle in the marshes embraces, as in Jeverland, about 75 per cent. for breeding purposes, and about 25 per cent. for the dairy. The latter are kept mostly to raise the calves, which are in general sold when one year old to the interior of Germany—to Saxony, Frankfort, and the southeast part of Prussia, at very good prices. The form of the animals is not so finely shaped as those in the Weser marshes and Jeverland, although in their appearances they show the greatest resemblance to the Holland and Jeverland races. The color of the cattle is about 80 per cent. black and white, and about 20 per cent. red. The first-named color is preferred, because its sale is more certain; the latter color is kept more for home use. A few months ago the institution of the herd-book was introduced. It does not, however, find the same approbation as in the Weser marshes. The breeders, however, try to improve their cattle by importing bulls from the north of Holland, in which it appears they succeed very well. The number of cattle raised in this part, that is to say, on the marshes, amounted, horses, sheep, and pigs included, as follows:

Date.	Horses.	Cattle.	Sheep.	Pigs.
December 31, 1867.	25,043	102,559	49,401	25,307
January 10, 1873.	28,918	129,975	81,143	27,773
January 10, 1880.	21,632	141,018	67,368	17,079
	25,609	125,785	54,597	31,267

This enumeration shows clearly that the farmers did not keep pace with their neighbors in Holland and Oldenburg; that, on the contrary, they have lost ground in their competition with those breeders who employ their whole energy to improve their cattle in the manner

wanted by breeders and buyers of the interior of Germany, the United States, Italy, and France, who in many instances pay prices double the amount that may be obtained in the ordinary way of disposing of the overproduce.

The cattle raised in the Geestland are, as before stated, not of any consequence for breeding purposes. In stature they are small, or rather insignificant, although it is not to be denied that they possess good milking qualities. Breeders exert themselves to improve their cattle by importing bulls from the province of Drenthe, in Holland, and it is stated that the result obtained by the cross-breeding has been very satisfactory, although the lightness and sterility of the soil do not assist them in producing such cattle as their endeavors deserve.

SUPERIORITY OF THE OLDENBURG CATTLE FOR EXPORT.

For exportation to the United States, the Oldenburg cattle raised on the Weser marshes must be put down as one of the best qualified races. To all parts of Europe, to the south of Germany, Prussia, east and west, Russia, Galicia, and even to the Sandwich Islands, these cattle have been exported. To Galicia last year there were exported thirty-eight head of exquisite registered cattle, destined to serve there as the commencement of breeding this race pure. Those cattle were bought here by a commission of the Royal Agricultural Society, at Lemberg. For this year the exportation, including the number bought by this commission and private estate holders, not obtainable, is said to be still larger. For several years the cross-breeding with the Shorthorn race was more prominent here, but since the laws of Great Britain prohibited the exportation of live cattle to the English ports, the farmers have relaxed in favoring this race, and returned to the pure Oldenburg breed, much to their own satisfaction and profit.

PRODUCT AND EXPORT OF MARSH CATTLE.

To compare the production and export in the Weser marshes I repeat here the result of the census taken thereof on the 10th of January, 1883. This census was taken at a very unfavorable time, when all salable beasts had been disposed of and the new production had not refilled the place:

District.	Cattle counted on January 10, 1883.	Number of cattle exported to different countries in Europe.
In the Weser marsh	79,448	22,984
In the Geestlands	94,198	6,183
Total	173,646	29,167

In the present year the demand for cattle for breeding purposes has been more active, in consequence of which the stock of first rate cattle is rather low and prices rule higher than before. Last year the medium price for non-registered bulls of one and a half to two years was \$100 to \$125; for elder animals of this sex, \$150. Cows, delivered from two to four calves, cost \$100 to \$125. Heifers, according to quality, \$100 to \$225. Bull calves, \$60. Cow calves, \$45 to \$55. For registered cattle

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94,108	6,183
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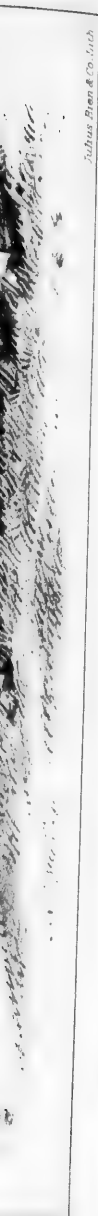
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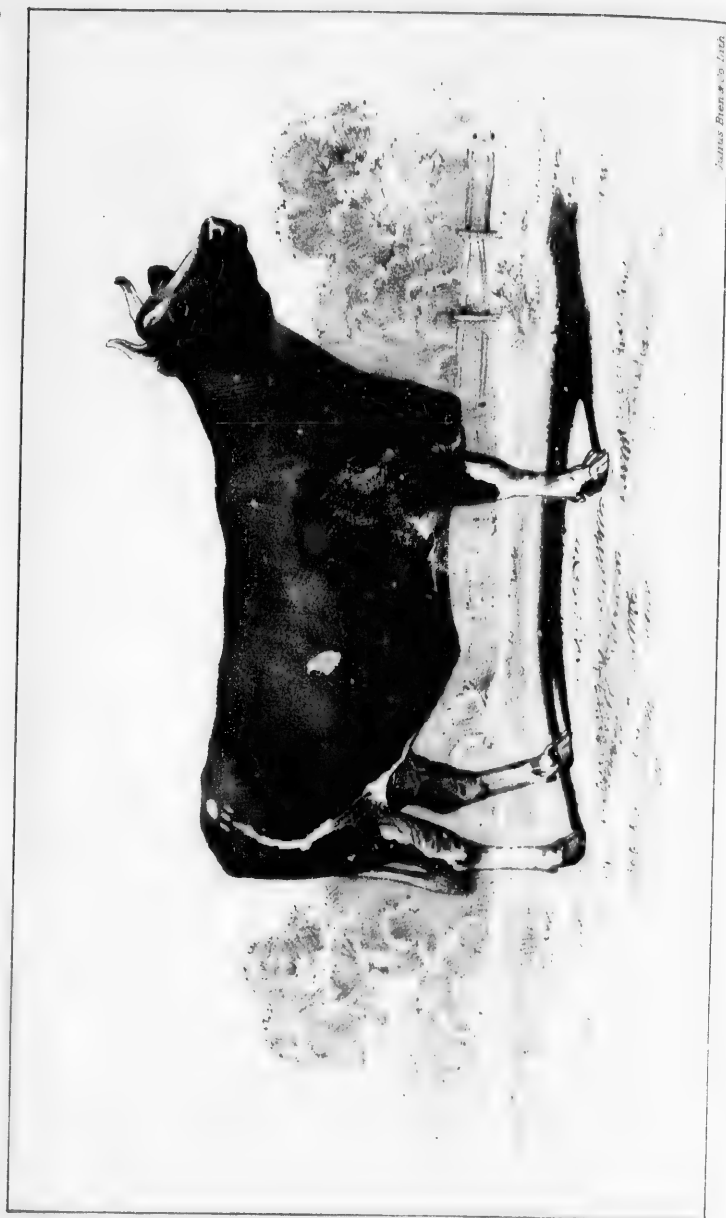


PRIZE SHORTHORN COW "ALICE"

Julius Ben & Co. Lith

PRIZE SHORTHORN COW "ALICE"





Source: Breese & Co. Ltd.

OLDENBURG PRIZE COW "ALLMUTH"

OLDENBURG PRIZE COW "ALLMUTH"



OLDENBURG PRIZE BULL.

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the prices were remarkably higher, from 10 to 50 per cent., according to their descent and quality. Purchasers must be very careful in buying the pure-bred Oldenburg cattle. Many a head of cattle passes for the pure Oldenburg race, as the Holstein cattle from Holland, which never saw Oldenburg nor Holstein.

EXPORT OF CATTLE TO THE UNITED STATES.

As to the best way of transporting cattle to the United States, this is done by the way of Brake-Nordenham to Bremerhaven, thence by steam to New York, Baltimore, or New Orleans. The freight for a full-grown beast will amount to about \$30 to \$36, in the common way of shipping. The cost for transport and maintenance whilst on the voyage would amount to about \$5 to \$10 per head, including feeding and waiting on board. This cannot, however, be exactly stated, as much depends on the number of animals sent. If many are to be sent, then a waiter is necessary, who would cost, passage going and coming included, about \$100, more or less, according to the accommodation required. The same amount to ship by way of Hamburg, or by way of Amsterdam or Rotterdam for cattle from East Friesland.

PORTRAITS OF OLDENBURG AND EAST FRISIAN CATTLE.

In order to compare the cattle bred in the marshes with other animals bred in Holland, France, and England, I transmit herewith several photographs of the Oldenburg and East Frisian race, prize cattle at the agricultural fair at Hamburg this year.

No. 1 of the accompanying photographs represents an Oldenburg bull of rather the old style, short and rather clumsy in bones. He does not answer the requirements of the herd-book union. The formation of the head and neck is coarse and fails in beauty. The parts of the shoulders and the formation of the ribs certainly are well developed, but the root of the tail lies too high; the hind quarters are hardly satisfying; the formation of the flesh near the ankle-bones or spring-joints is not full enough. The animal shows crooked hind legs, although the ankle-bones are normal. The animal is too short, and the line of the back answers but imperfectly the requirement of the herd-book union. The animal shows but few good milk-tokens, but more the signs of being easily fattened. He was raised on an estate between Brake and Oldenburg, on a mixed soil. His color is black and white, with a white star on the forehead.

No. 2 of the accompanying photographs is a cow of the pure Oldenburg breed. Owing to the unlucky position in which the waiter kept her head, she does not represent herself so favorably as might be wished. This is much to be regretted, as the picture does not give a good idea of the form of the beast, which is one of the best sort, with a very straight-lined backbone. Finer hip-joints or thighs are seldom met with. The ankle, leg-bones, and spring-joints are normal, and for her race she has a very fine head and breast; the depth of the latter is such as formerly was seldom met with. The form of the shoulders, ribs, hips, hind quarters, and thighs are such as is required by the herd-book union. The milk-tokens are very good and do not deceive. Her color is black and white, with white star on the forehead.

No. 3, a full-blooded Shorthorn cow about four years old. This animal was bred in the vicinity of Brake, and answers in form, &c., those demands which are required of this race. She was, at the time of the

Hamburg exhibition, rather overfed. Head, collar, and shoulder blades are very good, as well as the back, hips, and hind quarters. Nevertheless, the breeders in the marshes, with only a single exception, do not approve of this race. The extreme formation of fat at the root of the tail is not desired in the interior. For that reason the Oldenburg race is preferred. The thighs of the animal are highly developed, as well as the form of the breast, together with slender horn and bone formation. The standing of the hind legs is good, with normal ankle-bones or spring-joints. This animal is easily fattened, but the milk-tokens leave something to wish for. To this animal a first prize was awarded at the exhibition at Hamburg. The picture has the same fault as the others. The waiter, as well as the photographer, did not know what they were about; otherwise the head of the cow would not have been held as represented, the backbone receiving thereby an appearance as if it was not straight-lined. Color is white and brownish red.

No. 4 of the photographs is a prominent bull of the Oldenburg or Badjadinger race. The picture does not do justice in this case. The animal's head is kept far too high and out of place by its waiter, through which the backbone does not show the straight line it really possesses by nature. The standing of the hind legs is a normal one, the form of the thighs perfect, as also the form of the breast. The form of the head answers the original Oldenburg type; shoulders, back, hips, and the form of the hind quarters or croup are good, whereas the ribs might have been of a more round or barrel form. In general the cows of this breed combine good milking with fattening qualities. Color black and white, white legs, with white star on forehead.

No. 5 of the accompanying photographs represents a heifer about three and a half years old, by Magnate, out of an Oldenburg cow, pure Oldenburg breed. The form of the neck and head scarcely answers the requirements of the herd-book union. The neck is short and thick; head rather full and heavy; back and form of ribs good, as also the form of the hips and of the hind quarters or croup; the thighs are satisfactory, but the breast is too much trussed up. The ankles or spring-joints are good, whereas the breast might have been a little deeper and finer; the signs of easy fattening are more prominent than those of milk. Color white and black, with blaze on the forehead.

No. 6 represents a bull of the East Frisian race, three years old, born near Jemgum, East Friesland; is a good specimen of its race. Shows, by the unlucky position in which the head is kept, a slight downward curving in the backbone, which in nature is not the case; the animal otherwise presents itself favorably, and its offspring, according to the statement of its owner, are renowned for being fed fat and showing good milk-tokens. Color black and white, four white legs, and a blaze on the forehead.

No. 7 of the accompanying photographs, a Polled Angus bull, imported from England, is kept on an estate in the south of Holstein. The farmers in the marsh do not approve of this race, wherefore its introduction here, though tried several times, did not succeed. The picture shows the bull very favorably, but also shows far too many corners on the fore part of the hind legs. The picture is mentioned here only to show the difference between the several races. Color black, with rather mouse-colored hind legs.

By the kindness of L. Vissering, esq., King's counselor of the agricultural department and president of the principal agricultural society of East Friesland, at Dornum, I am enabled to present the photographs of cattle bred in East Friesland, Nos. 8, 9, and 10, herewith.

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PRIZE OLDENBURG OR BUDAPESTER HILL



Johns, Boston, 1878



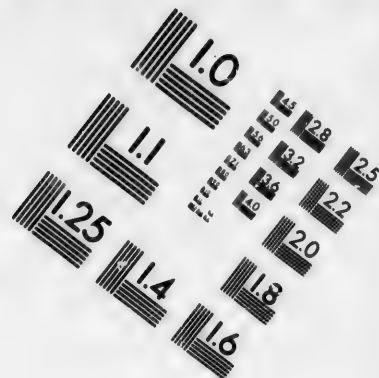
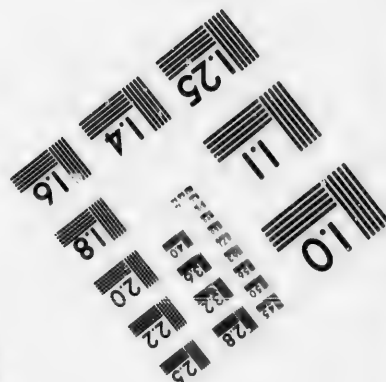
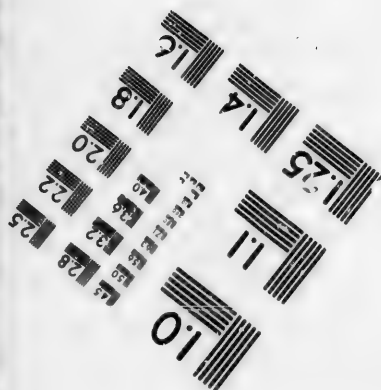
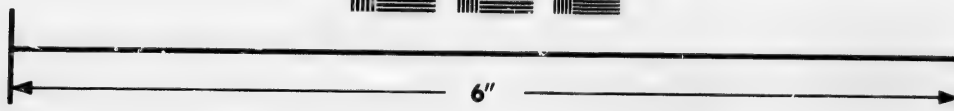
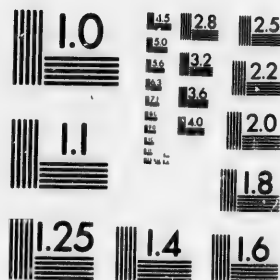


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Photographic Sciences Corporation

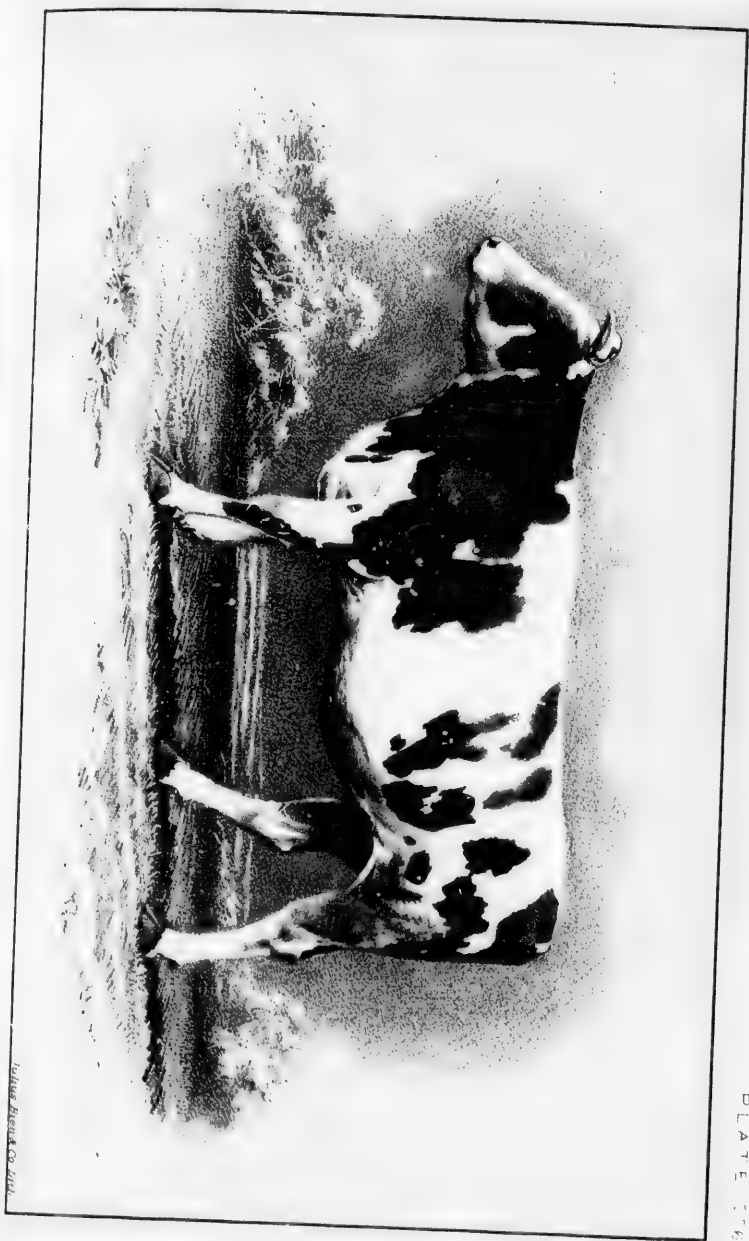
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WEBSTER, N.Y. 14580
(716) 872-4503**

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PRIZE OLDENBURG HEIFER

Julius Brand & Sohn



PRIZE OLDENBURG HEIFER

W. H. B. & CO. N.Y.

EAST FRISIAN PRIZE BULL.

Illustration by Linn



EAST FRISIAN PRIZE BULL

Julius Bonn & Co. Ltd.

POLLED ANGUS BULL

10-10-1910



POLLED ANGUS BULL

By John Brown & Co. 1910



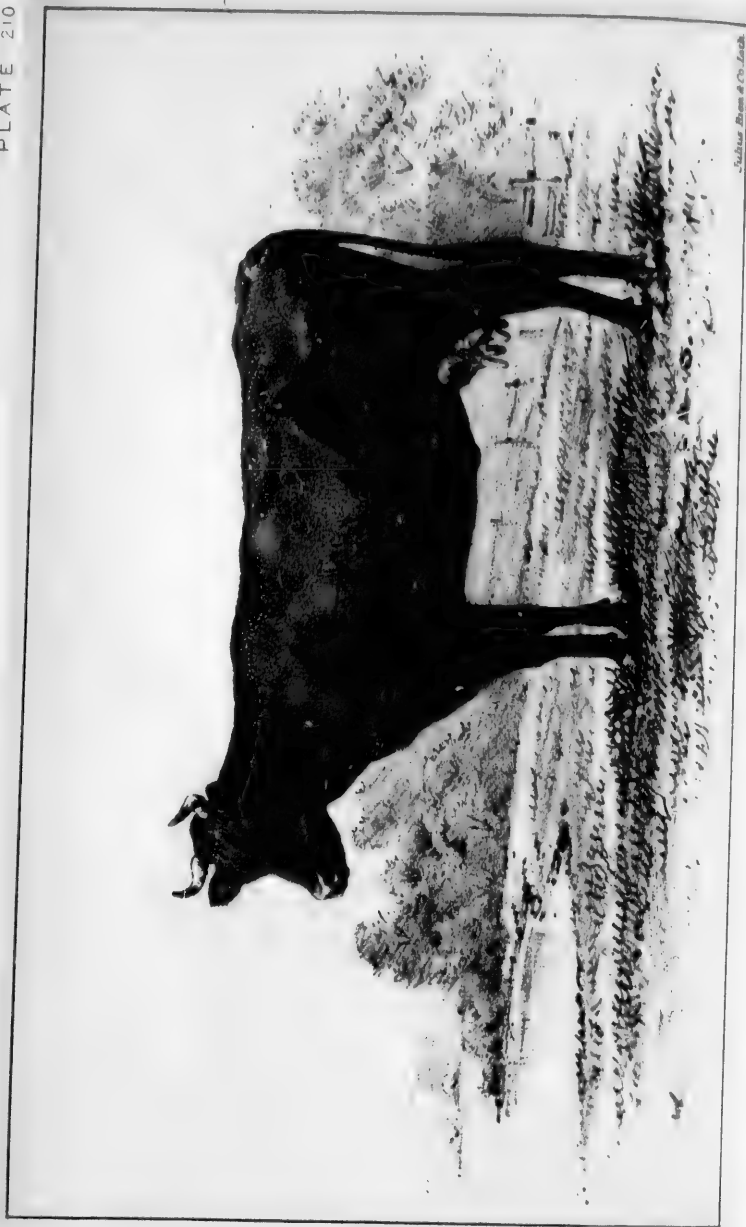


Julius Benn & Co. Lith.

AN EAST FRISIAN BULL

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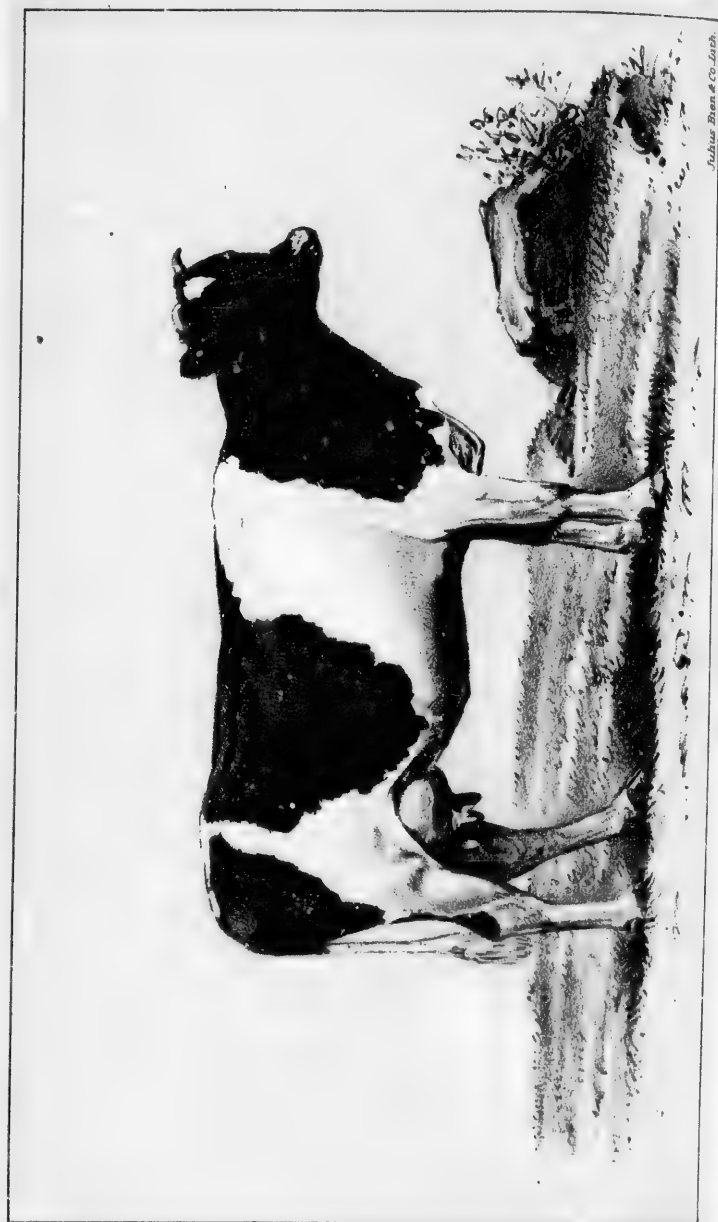




Published by the American Society of Animal Husbandry

AN EAST FRISIAN COW

AN EAST FRISIAN COW



Julius Ben & Co. Lith.

AN EAST FRISIAN COW

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No. 8 is an East Frisian cow, representing one of the finest milk cows of the race. Color black and white, white blaze, four white legs, tail half black, half white; is a first-rate milker, easily fed, and very enduring in all climates.

No. 9 is likewise an East Frisian cow, bred in that province, but now in the possession of a Mr. Peters, counselor of the agricultural department of Pomerania, is a very fine specimen of the red-colored race, said to be descended from the Anglian race. The animal is about seven years old, a very good milker, and very hardy. The best specimens of this race are raised in the district of Norden and Aurich.

No. 10 represents an East Frisian bull, now three and one-half years old, raised in East Friesland, now the property of the crown prince of the German Empire. The animal is a fair specimen, if not one of the fairest specimens, of his race, but shows rather heavy formation of bones, and is rather long-legged, with a slight downward curving in the backbone. The formation of the head is normal, but the root of the tail rather prominent. Color black and white, blaze, white legs, and black tail. These cattle are very enduring and will stand a passage across the ocean as well as the Oldenburg or Budjadinger race.

HOUSING, FEEDING, AND BREEDING.

Herewith I close the descriptive part of the cattle raised in my district, to enter more particularly upon the housing, feeding, and breeding of the cattle, and the disposition made thereof.

The cattle in the marshes pass from six to seven months of the year in the open air on meadows, which give plenty of nourishing and wholesome food, by which the more or less spare winter-feeding is fully compensated. The pastures are abundant in grasses, but rather poor of plants or herbages. For seventeen milch cows, in general, 10 hectares, or 25 acres, are required of good middling marshlands. To show the increase of weight of cattle grazing on good pastures in the marshes the following statement was given me by a well-to-do farmer in this vicinity: From May to October, last year, this gentleman fed, on meadows measuring 20.1993 hectares, or about 46 acres, forty-two oxen, sixteen sheep and calves, and one filly. For thirteen days the oxen were fed on meadows of which the grass had been cut before. The result of the feeding during one hundred and sixty-two days on meadows, for the oxen, was from 517.45 kilograms at the beginning to 731.45 at the end. The highest increase in weight was 303 kilograms, or 6 cwt.; the lowest amounted to 221 kilograms, or nearly 4½ cwt. The average daily increase amounted to about 3 pounds. Another farmer in the Weser marshes last year fed eight oxen on his best pasture grounds. They had lost during the winter housing and bad feeding about 5 cwt.

When put on the pastures, on May 4, Nos. 1 to 4 weighed about 30 cwt. and Nos. 5 to 8 about 35 cwt. When sold, on November 3, Nos. 1 to 4 weighed about 56 cwt. and Nos. 5 to 8 about 51 cwt. Average augmentation of weight per head, about 4 cwt., or about 43.5 per cent., or per day per head about 2½ pounds. The result of this grazing shows the value of the grass in the marshes for fattening cattle.

In the marshes it is common with the farmers to keep a larger number of cattle than their stables can accommodate during the winter. The overplus, in most every instance consisting of young animals, are usually sent to farmers in the Geestlands, there to be fed. The price paid for such feeding varies from \$7 to \$9 per head. This low price of course does not allow a feeding with good, nourishing fodder, the ani-

mals mostly being fed on straw, so that in general these cattle return in a very lamentable state or condition when the grazing time commences. For some time several of the farmers in the Weser marshes, Jeverland, and East Friesland have desisted from this old plan and are finding for their cattle better and larger accommodations, and feed them during the winter with more nourishing fodder, consisting of beans, cracked grain, and the different sorts of oil-cakes and rice. The rough forage is used in its natural state uncut, while cabbages, turnips, &c., are cut.

The housing of the cattle during the winter corresponds with the method in Holland. The feeding cribs, contrary to the method in use in the south of Germany, are situated a little lower than the floor in which the cattle stand, so as to give them more ease when rising. The whole arrangement in the stable enables the farmer to keep the cattle cleaner and clean them easier than otherwise would be the case. There is, also, a considerable saving of space and litter. In the marshes the calving of the cows in general takes place in the months from November to February, as this period is considered by all interested the most favorable, as it enables the breeders to bring the young calves to the grazing grounds early in spring. If brought there when younger the animals would hardly be able to withstand the inclemency of the weather. The new-born calves are not allowed to suck at the cows. The milk taken from the cows during the first three weeks only is given to them. After this time they are fed on buttermilk, bread soup, to accustom them gradually to a more consistent food. Cow and bull calves are fed just the same. To many of our farmers in the United States, this feeding may appear irrational, but experience shows that calves fed in this manner progress far more favorably than those fed for a longer period on milk, as these come into the pasture grounds with a tender stomach and with a luxuriant layer of flesh on their carcasses, which is not desired.

The young heifers, after the completion of their second year, are led to the bull. By this time these young animals have reached the development particular to the cattle bred in the marshes, so that they are able to support the embryo and to calve without injury to themselves.

Bulls when thirteen to fourteen months old cover cows. It is much to be regretted that for some time the breeders of these valuable animals when they are at their best development, sell the bulls to foreign breeders without any consideration as to the want at home. The Government and the unions of the herd-book try to put a stop to this injurious disposition, but without any avail. The prices paid by foreign breeders being so high as to enable the proprietors of such bulls to return the premium they received on the condition that the animal had to remain at least one year in the district for which the premium was granted.

Another factor in the breeding of the cattle in the marshes is the climate, which, to those not born and bred there, appears less than agreeable. The average fall of rain amounts to about 707 millimeters annually. In consequence of this climate, of which the middle temperature in summer seldom raises over 80° Reaumur, together with the more or less hardy rearing which the cattle in the marshes must endure, the latter may be classed as thoroughly sound and healthy. In no part of the northerly marshes do less diseases among cattle appear than here; contagious diseases, if any prevail, are brought here, and are sooner extirpated than in any other district. The broad chest of these cattle and their sound lungs prevent any pulmonary diseases. For a series of

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years no contagious diseases have been observed in this district; if brought in from Holland and other adjacent countries they always were localized and arrested in the places infected, wherefore I can only repeat my former assertion that the cattle in the marshes are the most hardy and healthy race of North Germany and Holland.

Having already reported in the foregoing on the disposition made of the overproduce of these cattle by the breeders, I only need refer to the annexed tables, in which further particulars are to be found.

AMERICAN CATTLE AND HOGS IN OLDENBURG.

Concerning the importation of live cattle from the United States to this district, I have to state that so far I find it to be confined to a few head. These did not come up to the expectations, showing too much of the Shorthorn blood, thereby taking a long time to fatten; so that this importation ceased after the first trial. Lately, however, live pigs of the Poland-China race have been imported from the United States with some success. These importations would no doubt have been more numerous if a reliable connection with breeders in the United States was easier to obtain. As it is, the commission, shipping, and expenses charged greatly enhance the prices. A respectable commission appointed here for sale or exchange of cattle for breeding or grazing purposes would, no doubt, greatly assist in the transaction of the cattle business, and certainly in a short time would render a good account.

IMPORTS OF MEATS AND DAIRY PRODUCTS.

Of other cattle produce imported here by way of Bremen and Hamburg, I have to mention besides canned meats, salt beef in barrels, salt pork in barrels, butter, and cheese. The salt beef, not only used for ships' provisions but also for inland consumption, is of some moment, whilst the importations of salt pork in barrels, by reason of the prohibitive import laws of Germany, consist only of those qualities used for ships' provisions—salt bacon, as well as refined lard, for inland consumption being strictly prohibited, the import thereof has entirely ceased. In official quarters in Berlin it would appear that the seafaring people of Germany are not considered subject to trichynosis, otherwise the exemption as above stated would not have been allowed.

The importation of butter or margarine is limited, as butter is over-produced here, and commands in the Bremen and Hamburg markets prices nearly 10 to 25 per cent. higher than other butter. The consumption of American butter and margarine is more or less confined to the more saving class of the population, whilst the poorer classes eat none at all, in lieu thereof eating raw smoked bacon.

PERCENTAGES OF THE DIFFERENT BREEDS OF CATTLE IN THE DISTRICT.

The percentage of the pure bred Oldenburg, Jeverland, and East Frisian cattle is about 65 to 75 per cent. in either province, whilst the Shorthorn cattle, bred only in the Weser marshes by one or two breeders, amount to about 10 per cent. The remainder is of a mixed breeds, not necessary to enumerate. For dairy purposes nearly 25 per cent. are bred, the remainder for breeding, slaughtering, or exportation.

BEST CATTLE FOR EXPORT TO THE UNITED STATES.

I am of the opinion that the best cattle to be imported into the United States from Germany, to improve the breed there, without any doubt

are the Oldenburg or Budjadinger race. Exact prices are not obtainable, as they vary from \$100 to \$200, according to age, quality, &c.

SPECIAL STATISTICS OF THE MARSH CATTLE.

In conclusion I submit answers to the questions transmitted with circular, giving names of breeds, country, size of cattle at maturity, milking qualities, origin of breed, topography of country, substratum, &c.

Name of breed.	Annual average yield of milk.	Milk to pounds of butter.	Milk to pound of cheese.	Size at maturity, measured on the fore parts (in meters).			Live weight.		
				Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
Oldenburg, bred in the Weser marshes	<i>Owt.</i> 61	35	Not made.	1.49	1.51	1.57	<i>Owt.</i> 14 to 15	<i>Owt.</i> 16 to 18	<i>Owt.</i> 17 to 20
Jeverland race	68	38 to 39	16	1.39	1.42	1.48	12 13	14 15	15 17
Geestland races	50	38	Not made.	1.34	1.36	1.29	9	11	12
Ost Friesian race	64 to 84	35 38	16	1.32	1.47	1.61	12 14	16 17	18 20
Shorthorn race	50 60	33	Not made.	1.50	1.52	1.60	14 16	20 22	20 22

Breed.	Age at maturity.		Weight of meat at maturity of ox.	Color.	Description.	How long bred pure.
Wesermarsh	<i>Years.</i> 3½ to 4	<i>Owt.</i> 8 to 9		Black and white with white star on forehead.	Head shorter, as with the Holland race; short legs; structure perfect.	A long time, except now and then crossed with Shorthorns.
Jeverland	4 5	8 9		White and black and four white feet.	Head longer; legs finer and longer; very good milkers.	A long time.
Geestland	3 4	6 6.72		White and black.	do	Do.
Ost Friesland	4	9 11		Black and white; white legs; star on forehead and black saddle on back; about 20 per cent. red.	do	Said to be of the Anglia race; breed a long time.
Shorthorn	4 5	10 12		White and red; some blue-black or mouse-colored.	Fine looking animals but rather too fat for inland consumption; require at least one year more grazing than the other races.	Twelve to fifteen years.

Breed.	Origin of breed.	Product.			
		Labor.	Meat.	Milk.	Cheese.
Wesermarsh	Pure Oldenburg breed with few exceptions.	(*)	\$90 to \$135	\$70 to \$80	(†)
Jeverland	Original breed	(*)	100 125	70 80	‡ 25
Geestland	Diverse breed	\$50 to \$80	75 90	60 80	(†) 25
Ost Friesland	Now said to be original; now and then crossed with Holland breed.	(‡)	85 90	70 80	
Shorthorn	England	(*)	100 125	60 70	(†)

* None required.

† None produced.

‡ Not used for labor.

Wesermarsh ..
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Geestland ..
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Topography.

District.	Altitude above high- water mark.	Mean tempera- ture.	Summer.	Winter.
	<i>Feet.</i>	<i>°R.</i>	<i>°R.</i>	<i>°R.</i>
Wesermarsh.....	2 to 15	5 to 6	7 to 8	14 to 24
Jeverland.....	3 10	5 7	8 9	11 24
Geestland.....	15 40	7 8	7 8	1 2
Ost Friesland.....	2 24	5 6	7 8	14 24

Soil.

District.	Alluvial.	Loam.	Clay.	Sandy, &c.
Wesermarsh.....	Entirely.	.....	All.	None.
Jeverland.....	$\frac{1}{2}$ None.	$\frac{1}{2}$ $\frac{1}{10}$	None.	$\frac{1}{10}$ None.
Geestland.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	None.
Ost Friesland.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	None.

Substratum.

District.	Limestone.	Sandstone.	Granite.	Clay.	Gravel, &c.
Wesermarsh.....	None.	None.	None.	All.	None.
Jeverland.....	None.	None.	None.	All.	None.
Geestland.....	None.	None.	None.	None.	None.
Ost Friesland.....	None.	None.	None.	$\frac{1}{2}$	None.

Cultivated grasses.

District.	Timothy.	Clover.	Rye grass, &c.
Wesermarsh.....	(*)	(*)	(*)
Jeverland.....			
Geestland.....	$\frac{1}{2}$	$\frac{1}{10}$	None.
Ost Friesland.....	$\frac{1}{2}$	$\frac{1}{10}$	None.

* Natural grasses.

Method of housing.—In stables built of bricks and thatched with reed, very healthy and warm in the winter. In summer, from April 30 to November 1, animals are feeding on the meadows.

Feeding.—Grass in summer. Hay, grain, beans bruised, oil-cakes, and different sorts of turnips in winter.

Breeding.—The bulls used for public use are selected by a commission. The herd-book is open for registry.

Handling products.—The live cattle are either sold at public sales or by private contract, or are sent into the interior by private commissioners. Butter and cheese are disposed of at Bremen or Hamburg.

JOHN M. WILSON,
Consul.

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Twelve to fifteen
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80	(1)
70	(1)

labor.

CATTLE IN SAXONY.

REPORT BY CONSUL MASON, OF DRESDEN.

I have the honor to reply to circular issued from the Department of State July 18, 1883.

The importance of the subject I immediately comprehended, and set to work to furnish all the information I could obtain, and hence the apparent delay in responding.

I found the greatest difficulty in procuring the desired information, especially that which would enable me to complete the tables or blanks furnished by the Department. At last I applied to the statistical bureau of Saxony for what information they could furnish me, to report to the Department of State. They replied in the following communication:

(Translation.)

The respectfully undersigned board of managers deeply regret being unable fully to answer the questions contained in the circular issued by the Department of State, Washington, on the 18th of July last, as inquiries relative to the diffusion of the various breeds of cattle and the fecundity of the offspring to be met with throughout the country have, up to this time, not been instituted. By means of the researches made in the year 1880 concerning the amount of bulls kept throughout the country, some valuable information has, however, been gained with regard to the breeds of bulls used for breeding purposes. As one is, at any rate, able to draw conclusions, from the bulls in existence, to the cut or tendency of the breeding, the undersigned board of managers have the honor of submitting to the consulate the results of the investigation under consideration in one of the supplements; in addition to which we beg to subjoin to the circular, which we do hereby return, a variety of jottings appertaining to the areas used for farming purposes, the live weight, and the selling value of the beasts, together with the results of the latest census of animals.

The Kingdom of Saxony does not only import vast quantities of cattle to be butchered for the market, but also introduces numbers of Oldenburg and Dutch cows, giving fresh milk, or great with young, which, subsequently to being milked until they cease to yield any more, are slaughtered, or, like imported heifers, used for breeding purposes. Only Voigtland draft oxen and fattened ones, or such as are undergoing a course of feeding, are exported in rather large quantities. The Voigtland cattle, which formerly were in very brisk demand, not only on account of the uncommon richness of their milk, but also by reason of their being strikingly adapted to be stalled, and, in particular, owing to their serviceableness as beasts of draft, are less frequently used for breeding purposes than they formerly were. The extension of this breed, which is the only one indigenous to this country, is but very trifling, since it is not to be met with anywhere except in the vicinity of Plauen, Oelsnitz, and Auerbach, consequently, in an area of 142,627 hectares. The stock of pure Voigtland beasts had formerly been diminished by exportation, which was carried to immoderate lengths. The efforts made by husbandmen and farmers of late to supply the markets with as much milk as possible has more and more dislodged or supplanted Voigtland cows. The Voigtland cattle, a reddish brown or bay-colored breed, of small build or stature, have white horns with black tips, and tails with white ends or points.

Accompanying the above communication were a set of tables embodying all the information obtainable from their cattle census of 1883.

While they do not conform strictly to the requirements of the blank tables furnished by the Department, I have thought it advisable and best to copy and transmit them in the form received from the statistical bureau. The labor was great, and the courtesy corresponding, by the statistical bureau, which I duly acknowledged in appropriate terms, and promised reciprocal courtesies at any time by this consulate, or any Department of the Government of the United States, when desired.

The courtesy, not only in this instance, but at all times, and by all departments of the Saxon Government, has always been complete and satisfactory, and it gives me great pleasure to assure the Department of it.

UNITED STATES CONSULATE,
Dresden, November 26, 1885.

JOS. T. MASON,
Consul.

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SAXON AGRICULTURAL AND CATTLE STATISTICS.

Areas that have proved productive, in an agricultural point of view, together with the areas appropriated to herbage for fodder, in the Kingdom of Saxony.

[Prepared at the royal Saxon statistical office, and translated and transmitted by Consul Mason, of Dresden.]

Departments of administration.	Mean altitude (elevation above the Baltic).	Population in the year 1880.	Total area.	Area that proved productive in an agricultural point of view in 1878.				
				Arable land and land cultivated as gardens.	Meadow ground.	Pasturage.	Vineyards.	Sum total.
Shrievalties:	<i>Hect.</i>		<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>
Bautzen	285.2	351,326	246,973.23	124,138.04	34,538.27	4,240.93	0.46	162,937.70
Dresden	209.4	808,512	433,685.73	240,884.01	49,057.12	8,829.51	1,263.04	294,734.88
Leipzig	179.3	707,829	356,735.44	244,270.98	85,286.42	2,528.97	19.35	252,463.70
Zwickau	468.3	1,105,141	461,809.91	203,274.31	67,255.57	4,592.46	0.12	275,122.26
Kingdom	308.1	2,972,805	1,499,294.31	872,268.24	186,137.18	15,529.67	1,282.05	1,015,218.04

Departments of administration.	The following herbage for fodder and grasses were cultivated as main crops or produce in the year 1878.							In addition to which spurry, &c., was cultivated as an after or a later crop.
	Clover.	Esparcet, buck's head, and serradella.	Spurry.	Timothy grass, meadow cat-tail grass.	Eye grass.	Lucern.	Various kinds of other grasses.	
Shrievalties:	<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>	<i>Hect.</i>
Bautzen	15,500.02	39.85	204.63	0.88	26.04	18.91	228.21	16,079.12
Dresden	28,809.20	36.32	17.06	3,105.66	156.50	231.16	4,340.04	34,769.94
Leipzig	24,727.13	5.61	9.06	55.16	317.63	214.15	1,794.96	27,123.70
Zwickau	23,237.00	.....	0.34	3,944.85	81.97	66.00	6,196.70	33,527.46
Kingdom	90,364.55	81.78	231.07	7,196.55	576.14	520.22	12,550.91	117,506.22

Breeds and number of bulls used for breeding purposes in Saxony in 1880.

Departments of administration.	Low country breeds.							Spotted mountain breeds.	
	Dutch.	Oldenburg.	Dezau.	Old Margravates.	Anglera.	Wlattermarb.	Brittenburg.	English breeds.	Simme Valley.
Shrievalties:									
Bautzen	232	266	1	.....	.....	.....	.....	34	1
Dresden	139	1,003	10	10	3	1	16	21	5
Leipzig	261	620	2	1		4	1	34	8
Zwickau	181	373	2					6	49
Kingdom	813	2,162	22	11	3	5	17	95	63

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Breeds and number of bulls used for breeding purposes in Saxony in 1880—Continued.

	Gray mountain breeds.			Glen Valley.	Vaigland.	Crossing of native cattle with the preceding breeds.	Duchies breeds.	Bulls without any definite cut or tendency of breed.	Sum total.
	Allgan.	Swiss.	Walz Valley.						
Shrik vallies:									
Bainton	51	5	—	—	—	490	26	620	1,330
Dresden	128	3	—	—	—	661	148	1,039	3,181
Lipsale	388	17	4	—	6	672	48	628	2,712
Zwickau	303	0	1	9	130	426	50	806	2,406
Kingdom	880	34	5	9	130	2,248	281	3,272	10,128

Diffusion or extension of the various kinds of molds or vegetable earths in Saxony.

	Hectares.	Per cent.
Collective area belonging to—		
Diluvium	231,275	23.21
Granite and aenite.	231,371	15.41
Gneiss	181,378	13.76
Clay-slate	96,500	10.76
Glimmer-slate (Glimmerschiefer)	87,393	6.52
The formation of peat (brown coal).	78,309	5.22
Porphyry and melaphyr	72,942	5.00
The lower new red sandstone (new red conglomerate).	46,597	3.48
The formation of gray wacke	46,597	3.48
Whitestone	44,601	2.98
Square stone (broad stone).	31,711	2.11
Dabase (primitive rock).	40,508	2.69
Ten other molds		
Total	1,409,707	100.00

STOCK OF CATTLE IN THE KINGDOM OF SAXONY.

[Statement prepared at the royal Saxon office of statistics, and translated and transmitted by Consul
Mason.]

On the 10th of January last a general census of cattle, or brute poll, was taken throughout the German realm, and almost at the very same time investigations were made relative to the selling price and the live weight of the beasts. The results of both the official enumerations in question, as far as the Kingdom of Saxony is concerned, have been prepared and duly submitted to us. It consequently is in our power to compute or estimate the aggregate value and the collective weight of the cattle kept in the country. In Saxony both the average selling value and the average live-weight of an animal of middling quality have been ascertained by the instrumentality of the agricultural district associations. According to the middling selling value of the various animals with regard to the prefectships, the total stock of cattle throughout the country is valued at 238,761,268 marks.

The same

Foals less than one year old
Foals from one to two years old
Foals from two to three years old
Stallions three years and older
Others three years and older

HORN'S

Mules and hinny

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Sheep in general

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Swine in general

Kids less than one
(boats one year old)

Goats in general

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Calves less than 6 months
Calves from six weeks to 6 months
Fawns or young deer
Bulls two years of age and over
Other oxen and buffaloes
Cows two years of age and over

Horned cattle in g

Sucking pigs and
Breeding sows (full)
Other swine one year

Swine in general

0—Continued.

The same is composed as follows, viz :

Number of live animals.

Number of live animals.			
Description.	Number.	Estimated total value.	Value per head.
Horses.			
Foals less than one year old.....	1,850	<i>Marks.</i> 831,795	<i>Marks.</i> 179.3
Foals from one to two years old.....	3,061	1,169,013	361.3
Foals from two to three years old.....	4,324	2,121,369	627.1
Stallions three years old, and exceeding that age.....	1750	1,167,685	1,074.9
Others three years old, and exceeding that age.....	117,715	79,939,354	678.6
Horses	120,886	83,066,216	.....
Mules and hinnies	18	3,950	218.3
Asses (donkeys)	26	2,004	78.3
Neat or horned cattle.			
Calves less than six weeks old.....	15,606	457,164	29.3
Calves from six weeks to six months old.....	40,382	2,433,594	60.3
Fawns, or young animals from one-half year to two years old	118,703	14,739,064	124.0
Bulls two years old, and exceeding that age	4,903	1,249,520	254.4
Bulls two years old, and exceeding that age	29,685	7,730,681	260.4
Other oxen or bulls two years old, and exceeding that age	442,050	106,427,655	240.7
Horned cattle in general	651,329	133,018,688	.....
Sheep.			
Fine woolled sheep kept for shearing purposes, less than one year old.....	9,848	161,363	16.4
Fine woolled sheep kept for shearing purposes, one year old and older.....	31,267	787,338	25.2
Improved sheep bred for butcher, less than one year old	15,412	306,816	19.9
Improved sheep bred for butcher, one year old and older.....	42,473	1,238,619	29.2
Other sheep less than one year old	10,762	146,297	13.6
Other sheep one year old, and exceeding that age	39,255	793,995	20.2
Sheep in general	149,037	3,434,528	.....
Swine.			
Sucking pigs and porkers less than one year old.....	282,568	8,654,644	30.6
Breeding sows (farrows) upwards of one year old	28,287	2,806,014	90.2
Other swine one year old, and exceeding that age	44,695	5,304,469	118.6
Swine in general	355,550	16,765,047	.....
Goats.			
Kids less than one year old	21,406	233,065	10.8
Goats one year old, and exceeding that age	95,081	1,637,700	17.2
Goats in general	116,547	1,870,825	.....

Bulls without any defect, note cut or tendency of breed.	Sum total.
820	1,935
1,019	3,181
628	2,412
865	2,400
3,272	10,128

in Saxony.

hectares.	Per cent.
348,048	23.21
231,275	15.42
206,871	13.76
161,376	10.76
96,509	6.57
85,393	5.69
78,309	5.22
74,767	5.06
52,242	3.48
46,567	3.11
44,061	2.98
31,711	2.11
40,508	2.69
109,707	100.00

The live weight has only been ascertained with regard to horned animals and swine.

Description.	Number.	Total weight.	Average weight.
Horned cattle.			
Calves less than six weeks old	15,606	<i>Pounds.</i> 1,512,175	<i>Pounds.</i> 96.9
Calves from six weeks to six months old	40,382	7,580,129	187.7
Fawns or young animals from a half year to two years old	118,703	47,488,723	400.1
Bulls two years old, and exceeding that age	4,903	4,647,113	947.8
Other oxen and bulls two years old, and exceeding that age	29,685	26,358,300	887.9
Cows two years old, and exceeding that age	442,050	351,131,655	794.3
Horned cattle in general	651,329	438,717,555	.....
Swine.			
Sucking pigs and porkers less than one year old	282,568	16,250,158	57.5
Breeding sows (farrows) one year old and older	28,287	6,237,497	220.2
Other swine one year old and older	44,695	11,821,841	264.5
Swine in general	355,550	34,308,496	.....

CATTLE AND DAIRY FARMING.

CATTLE CENSUS, OR BRUTE POLL, OF THE KINGDOM OF SAXONY.

[Taken January 10, 1883.]

Cattle belonging to households (farms) including such beasts as are temporarily absent.

Description.	Shrievalty of—				Total in 1883.	In 1873.
	Bautzen.	Dresden.	Leipsic.	Zwickau.		
Number of owners of cattle:*						
(1) Settled.....	32,890	43,402	30,773	50,352	163,417	156,856
(2) Unsettled.....	1,247	4,166	5,324	2,606	13,243	12,506
Calves up to 6 months old:						
(3) Up to 6 weeks.....	2,533	4,440	4,270	4,363	15,866	
(4) From 6 weeks to 6 months (males)	1,411	2,443	1,594	3,569	8,954	
(5) From 6 weeks to 6 months (females)	5,465	9,530	7,420	9,004	31,428	56,633
Fawns, or young animals from one-half year to 2 years old:						
(6) Bulls (cattle for breeding)...	2,508	3,703	4,455	2,857	13,585	6,885
(7) Gelded oxen.....	1,136	3,110	888	7,588	12,520	
(8) Female fawns.....	14,424	26,940	25,482	28,743	92,589	113,317
(9) Bulls actually used for breeding purposes (in 6)	1,105	1,874	1,794	1,277	6,050	6,885
Horned cattle 2 years old and over:						
(10) Bulls (cattle for breeding) at least 2 years old.....	969	1,511	1,119	1,284	4,903	5,000
(11) Any other bulls or oxen.....	3,236	6,456	2,694	17,209	29,685	40,443
(12) Cows.....	71,128	133,540	115,873	121,509	442,050	429,785
Total number (3 to 8 and 10 to 12).....	102,830	191,744	163,512	190,243	651,329	647,972

* The number of owners apply to all live stock, cattle, horses, mules, asses, sheep, goats, and swine.

Horses, mules, and asses in Saxony.

Description.	Shrievalty.				Total in 1883.	Total in 1873.
	Bautzen.	Dresden.	Leipsic.	Zwickau.		
Foals:						
Less than one year.....	251	549	613	487	1,850	1,538
From one to two years.....	425	705	1,113	818	3,061	2,214
From two to three years.....	461	890	1,611	1,116	4,024	2,153
Horses three years old and over:						
Stallions for breeding purposes.....	3	163	39	11	156	136
Used for agricultural labor.....	10,562	26,179	28,521	17,001	82,263	76,473
For military purposes.....	62	3,114	2,801	67	6,044	5,765
All other.....	2,937	9,444	8,895	8,192	29,468	27,511
Total.....	14,721	40,930	43,583	27,642	126,886	115,792
Foals born in the year 1882.....	174	294	422	274	1,164	
Mules and hinnies.....	2	6	7	3	18	26
Asses.....	4	7	12	3	26	86

Sheep in Saxony.

Description.	Shrievalty.				Total in 1883.	Total in 1873.
	Bautzen.	Dresden.	Leipsic.	Zwickau.		
Fine-wooled sheep for shearing purposes, merinoes:						
Less than one year old.....	1,032	2,597	5,259	960	9,848	
One year old and over.....	2,603	8,743	17,278	2,638	31,267	108,465
Improved sheep bred for the butcher:						
Less than one year old.....	2,680	3,864	7,178	1,681	15,412	
One year old and over.....	6,601	12,388	18,233	5,211	42,473	50,238
All other sheep:						
Less than one year old.....	876	2,206	5,411	2,289	10,782	
One year old and over.....	2,441	8,433	20,815	7,566	39,255	48,130
Total.....	16,337	38,181	74,174	20,345	149,037	206,833

Description

Swine:

Less than one year
suckling pigs
One year old and over
Breeding sows
Other swine at

Total

Goats:

Less than one year
One year old and over
She goats
Any other, at le

Total

Bautzen

Dresden

Leipsic

Zwickau

Total in 1883.....

Total in 1873.....

In accordance
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Swine and goats in Saxony.

Description.	Shrievalty.				Total in 1883.	Total in 1873.
	Bautzen.	Dresden.	Leipzig.	Zwickau.		
Swine:						
Less than one year old, including sucking pigs	30,182	86,216	114,772	51,398	282,568	.....
One year old and over:						
Breeding sows (farrows)	2,265	11,509	11,754	2,699	28,287	.....
Other swine at least one year old	4,878	12,427	15,782	11,608	44,695	.....
Total	37,325	110,212	142,308	65,705	355,550	361,969
Goats:						
Less than one year old and kids	6,545	6,287	4,025	4,609	21,466	.....
One year old and over:						
She goats	30,750	24,040	12,267	19,777	87,433	.....
Any other, at least one year old	1,416	2,641	1,403	2,178	7,638	.....
Total	38,720	33,568	17,695	26,564	116,547	165,487

Bees in Saxony.

Shrievalty.	Total number of bee-hives.	Hives with movable honey-combs among this total.
Bautzen	11,344	5,375
Dresden	16,657	4,300
Leipzig	14,783	6,304
Zwickau	11,972	5,891
Total in 1883	53,756	21,870
Total in 1873	64,367	18,579

SILESIA CATTLE.

REPORT BY CONSUL DITHMAR, OF BRESLAU.

INTRODUCTORY AND EXPLANATORY.

In accordance with instructions contained in the circular of July 18, I inclose herewith the result of investigations regarding the altitudes, climate, soil, and cattle food-products of Silesia and its native and other breeds of cattle, with such information as was obtainable regarding the best breeds for the dairy, for work and for slaughter, the percentage of the various breeds kept in the province, and the amount and mode of export hence. In the absence of any printed statistics on these subjects, and of any work describing the native cattle of Silesia and the foreign breeds and crosses considered most desirable, I have been obliged to depend upon personal inquiry, verbal and in writing, and on the assistance of several gentlemen who were in position to obtain the most trustworthy information on the subject of the inquiries; notably Mr. A. Körte, author of a standard work on "The wool sheep," whose business in the last six weeks obliged him to traverse the province nearly from end to end; Professor Galle, dean of the philosophical faculty of the Breslau University, who furnished the altitudes and mean temperature of the country; Dr. Neefe, director of the Breslau statistical bureau, and Messrs Leo Sachs and Paul Puschmann.

SILESIA—AREA, CLIMATE, SOIL, TOPOGRAPHY, ETC.

Silesia, the southeastern province of the Kingdom of Prussia, has an area of 15,550 square miles, extending from north latitude 49.49 to 52.04, and from east longitude 31.21 to 36.56. It is divided into three administrative districts, Upper, Lower, and Middle Silesia, officially known by the names of their capitals, Oppeln, Liegnitz, and Breslau. The county of Glatz, still known by its old designation, belongs to Middle Silesia. The southern parts of Middle and Lower Silesia are mountainous; the rest of the province is flat, with the exception of some spurs of the Giant Mountains, which rise abruptly from the lowlands, the Trebnitz Hills, and the hilly portions of Upper Silesia. About 54 per cent. of the area is hilled land and gardens, 9.07 meadow land, 1.09 pasture land, and 29.07 woodland.

The temperature, both summer and winter, is uniform throughout the province, the winter mean being -1.4 to -2.4 C., the summer $+17.3$ to $+18.3$ C., and the annual mean $+7-8$ C. In the highlands of the Sudeties and in Upper Silesia, at an elevation of 650 to 1,300 feet, the mean winter temperature is -1.7 to -3.7 C., and that of summer $+15$ to $+17.2$ C. On the highest peak of the mountains, the Schneekoppe, 5,292 feet above the sea, the mean summer temperature is $+8$ C.; winter observations have only recently been made, and the mean has not yet been fixed. Breslau, situated nearly in the center of the province, at an altitude of nearly 400 feet, has a winter mean of -1.9 C. and a summer mean of $+17.3$ C.

The greater part of the province is drained by the Oder River, a small portion in the southeast by the Vistula, the wedge-shaped western extremity and the mountain district near the source of the Elbe (Silesian side of the Giant Mountains) by the latter river. As the country through which the Oder flows is for the most part but little higher than the surface of the river at ordinary high water, the stream has had to be diked nearly its entire length, the dikes at some places being within a few yards of the river bed, at others nearly half a mile distant. Once or twice in each year all the land within the dikes is inundated, and not infrequently the water overflows the banks. Within the banks the soil may be termed alluvial; not much effort is made to cultivate it, but it is good meadow land and yields fine crops of hay.

The highlands of the Sudetic range, with their valleys, possess a fruitful loamy soil of no great depth, being underlaid by granite, green sandstone, slate, basalt, and old limestone.

The soil on the left bank of the Oder is mostly clayey, with a considerable admixture of sand, but is esteemed for all agricultural purposes superior to that on the right bank, which is mainly sand and sandy loam, resting principally on recent limestone and red sandstone (coal formation). The altitude ranges from about 328 feet at the point where the Oder leaves the province to about 2,139 feet, the highest cultivated point in the Giant Mountains, and 4,200 feet, the highest point of summer pasturing. The two highest peaks are the Schneekoppe, in the Giant Mountains, over 5,000 feet, and the Schneeberg, in the Glatz Mountains, over 4,500 feet. (These names are applied to certain sections of the mountains; the entire range is known as the Sudeties.)

CATTLE FEEDING IN SILESIA.

Grasses.—The grasses cultivated are red clover, white clover, timothy, rye grass, especially on limestone soil, lucerne, and serradella. In addition to these grasses, Indian corn, sown in drills, is cut green for

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fodder (the grain does not ripen), and lupines, vetches, and fodder beans are also largely planted.

In my annual report for 1879 the number of hectares sown in grasses and other fodder plants was given, and as the proportion does not probably vary materially from year to year, except that a larger amount of Indian corn stalks is now produced—the figures are here reproduced.

Articles.	Hectares.	Articles.	Hectares.
Lupines	26, 265	Serradella	2, 250
Vetches	21, 256	Garrasotto	1, 279
Fodder beans	1, 877	Rye grass	1, 009
Maize	28, 975	Timothy	470
Clover	203, 187	Other grasses	980
Lucerne	6, 041	Other fodder plants	16, 703

Root-feed.—Prominent among the articles of food, alike for dairy and for meat cattle, are the potato-mash “swill” produced by the 1,083 distilleries within the province, the “grains” from its 965 breweries, the best residuum or pulp from its 50 sugar factories, and the offal of its numerous potato-starch factories. I have before me a statement showing the amount of arable land, of wood and meadow land, water, &c., of an estate of 617 hectares in Lower Silesia, wherein, in the column devoted to live stock, occurs the following: “Cattle fattening—food produced from sugar factory and distillery.” The exceptions to this method of feeding are the cattle farms and stables in whose immediate neighborhood the factory offal is not to be obtained. In such places potatoes, beets, and turnips form a part of the winter food.

HOUSING.

As a general rule cattle are confined in stables the year round, the land being considered too valuable for grazing, except for a few weeks in the late summer and autumn, before the stubble is plowed under. The stables are mostly warm and dry, and surrounded by the farm-yard, into which the cattle are sometimes turned for a few hours’ airing. Exceptions to the rule of dry and warm stables are, however, not wanting. In the mountain districts alone the cattle are pastured throughout the summer, and stable-feeding is practiced only in winter. The small farms in the lowlands, and such farm laborers and mechanics as are able to keep a cow, let their cattle graze along the waysides and ditches, feeding in the stables only night and morning.

CATTLE-BREEDING IN SILESIA.

As regards cattle breeding, this is systematically neglected by the small farmer, while many owners of large estates view the matter solely with an eye to present profit, without regard to the permanent improvement of their stock. They pay little attention to blood or pedigree, contenting themselves with the purchase of a few fine bulls selected from some stock of good repute, either at home or abroad.

DAIRY FARMING IN SILESIA.

Milk.—More care has been bestowed upon the treatment of dairy products in recent years than formerly, resulting partly from the establishment of a Government dairy school in Upper Silesia. Dairy associations, disposing of 8,000 to 20,000 liters of milk each per day, are of recent origin, but are already numerous. Dairy farms within easy dis-

tance of this city get $2\frac{3}{4}$ cents per liter for their milk, retailers selling it for $3\frac{1}{2}$ to $4\frac{1}{2}$ cents; in the country the usual contract price is $2\frac{1}{4}$ cents per liter.

Butter.—The good reputation of Silesian butter dates, it is asserted, from the middle ages, and is still deserved. As an article that will keep, and, therefore, adapted for exporting, it is considered equal to the Mecklenberg and Danish butter. The mountain butter at present commands the highest price in this market. Good table butter costs from $28\frac{1}{2}$ to $35\frac{1}{4}$ cents per pound. In midwinter the price is frequently higher.

Cheese.—Cheese-making has not attained any great perfection or proportions, and little technical skill has been developed by the manufacturers. Besides some imitations of Swiss, Limburger, and Dutch cheese, small Silesian cheeses, called "koppenkäse," are produced. These are sold mainly in the province and in the Berlin retail market. Foreign cheese, notably English, Dutch, French, Swiss, Italian, and Russian, is sold here in considerable quantities.

CATTLE FAIRS IN SILESIA.

In recent years cattle fairs, initiated by the Government, have done much toward improving the breeds of cattle in Silesia, as well as other parts of Prussia. A lively competition for the premiums offered for the best bulls, cows, and oxen has been incited among the owners of the larger estates by these exhibitions.

CATTLE IMPORTS AND EXPORTS OF SILESIA.

Although many foreign cattle are imported for breeding and dairy purposes, but few animals are purchased abroad for fattening. Some lean, coarse cattle are brought from the east and southeast by dealers to be fattened for the market, but their number is comparatively insignificant. Cattle are exported hence to Saxony, Berlin, the western and Rhine provinces, and some to Hamburg. From Hamburg they sometimes go to England, but the shipments to that country from here direct are infrequent. The export of fat cattle from Silesia amounts to from 50,000 to 70,000 head per annum. Besides the best qualities of slaughter cattle, some working oxen are also exported. Among the best cattle for export hence are the Oldenburg breed for working oxen, having hard hoofs and great endurance; the Wilstermarsch (Holstein) and Dutch cross, an abundance of milk and good meat; Shorthorn and Oldenburg cross, the former making much fat the latter much meat, and combined producing the best butcher's meat. The Shorthorn has a soft hoof, disqualifying it as a worker.

The freight from here to Hamburg for a car-load of 10 to 13 cattle of an average weight of 1,400 pounds is \$4.50, including fare of attendant. Time, 24 to 36 hours. The cattle are closely tethered to the floor of the car, and are neither fed nor watered on the road.

As a rule, the best slaughter cattle are purchased by the dealers for export, leaving the poorer descriptions for consumption within the province. At the last cattle market in this city 364 head were offered, 147 being oxen, 217 cows. The prices paid (slaughtered weight) were \$14.04 to \$14.28 per cwt., exclusive of market fees or octroi tax, for "prime" cattle, \$11.66 to \$11.90 for medium, and \$6.66 to \$7.14 for poor lots. Export cattle fetch on the farms, live weight, \$9.52 per cwt. for prime steers, \$7.14 to \$8.52 for good quality, and \$5.96 to \$6.43 for lean animals. The cattle for export are shipped at stations beyond the city and pay no city dues.

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CHARACTERISTICS OF SILESIAN CATTLE.

The number of cattle in Silesia on the 10th of February last was 1,394,145. The breed peculiar to the country, known as the Silesian race (Schlesisches Landvieh), has many excellent characteristics. The cows yield a fair quantity of rich milk, and both cow and ox are highly prized as draught cattle. They are hardy, of great endurance, easily fed, and their flesh is palatable and nutritious. They are essentially the poor man's cattle, and are to be found in their original purity mainly on the smaller estates. Their color is red, and red and white, and their horns are similar to those of Ayrshires. With their long legs, broad chests, and small haunches, however, they do not meet the demands either of the cattle fancier or of the English butcher.

An offshoot of this race, differing but slightly in appearance, but giving a still better quality of milk, though less in quantity, is called the "Silesian mountain cattle" (Schlesisches Gebirgsvieh), also red, or red and white, but usually white-backed. These mountain cattle have been crossed with the Simmenthal (Switzerland) and the Algäu (Bavarian highlands) cattle with the best results. The few animals from the Zillertal, in the Tyrol, brought hither by some Protestant exiles many years ago, have also been crossed with the Silesian mountain and the Simmenthal breeds, but without any marked improvement. A cross of the lowland cattle with the Shorthorn cattle, continued through several generations, has produced a breed known as the Silesian Shorthorns, combining the best qualities of both races. The Silesian cattle are thus described:

Silesian cattle of the plains.

Name of breed: Silesian lowland cattle.
 Annual average pounds of milk: 5,000.
 Milk to pounds of butter: 14 to 1.
 Milk to pounds of cheese: 7 to 1.
 Size at maturity: Cow 140, bull and ox 160 centimeters high.
 Live weight at maturity: Cow 900, bull 1,200, ox 1,000 pounds.
 Age at maturity: Four years.
 Weight of meat at maturity: 600 to 700 pounds.
 Color: Red, and red and white.
 Description: Long legs, medium breadth, normal chest, small haunch, horns comparatively small.
 Origin of breed: Known only as Silesian.
 Product: Oxen and cows esteemed as workers; meat regarded as good; milk of excellent quality.

Silesian mountain cattle.

Name of breed: Silesian highland cattle.
 Annual average pounds of milk: 3,600.
 Milk to pounds of butter: 12 pounds to 1.
 Milk to pounds of cheese: 6 pounds to 1.
 Name of country: Giant Mountains and county Glatz.
 Size at maturity: Cow 125, bull 140, ox 160 centimeters high.
 Live weight: Cow, 700; bull, 1000; ox, 900 pounds.
 Age at maturity: four years.
 Weight of meat at maturity: 500 to 600 pounds.
 Color: Red, and red and white, mostly white-backed.
 Description: Long legs, broad chest, small rump.
 Origin of breed: Silesia.
 Products: Good working cattle; difficult to fatten, but meat considered good; milk of excellent quality.
 These cattle are highly valued by the small farmers in the mountain districts. They are hardy, and can be kept at much less cost than imported breeds.

IMPORTED BREEDS IN SILESIA.

On many of the larger estates and dairy farms none but imported breeds are kept, chiefly those from Holland, Frisia, Oldenburg, Schleswig-Holstein, and England. The Dutch cattle are the most numerous, but deteriorate here, owing either to the climate or to the difference in the food, or perhaps to both causes. Fresh stock is imported every few years by some farmers, others import only fresh bulls, while still others cross with other breeds, such as the Silesian, the Wilstermarsh, and the Oldenburg. The Dutch cattle, with the exception of the large Amsterdam breed, are black, and black and white; the latter are mainly dun-colored. The Dutch cows and their crosses give a large quantity of milk, less rich than that of the Silesians. The average yield is from 6,000 to 7,000 pounds per annum. Their live weight is 1,300 to 1,400 pounds.

THE FAVORITE BREEDS IN SILESIA.

Taking at random 400 of the larger estates in various parts of the province in order to ascertain which is the most favorite breed, I find that on these estates the following cattle are kept:

Breeds of cattle.	Estates.
Dutch cattle of more or less pure blood	141
Dutch and Silesian cross	35
Dutch and Oldenburg cross	20
Dutch and Swiss cross	10
Dutch and Shorthorn cross	9
Dutch, English, and Shorthorn cross	6
Dutch and Zillerthal cross	1
Dutch and Wilstermarsh cross	12
Dutch and English cross	1
Dutch and German cross	7
Dutch, Oldenburg, and Swiss cross	2
Dutch and Mürzthal (Styrian) cross	1
Dutch and East Frisian cross	1
Dutch, Swiss, and Wilstermarsh cross	1
Dutch and Aigau (Bavarian) cross	3
Dutch and Danzig cross	4
Dutch and Tondern (Holstein) cross	1
Dutch, Silesian, and Wilstermarsh cross	1
Dutch, Oldenburg and Wilstermarsh cross	1
Dutch and Ayrshire cross	1
Mixed Dutch and other races	14
Silesian Lowland	27
Silesian Highland	1
Silesian and Oldenburg cross	12
Silesian and Swiss cross	1
Silesian and Schleswig cross	1
Silesian and Shorthorn cross	3
Silesian Highland and Swiss cross	2
Silesian and Frisian cross	1
Oldenburg	15
Oldenburg and Shorthorn cross	3
Oldenburg and Wilstermarsh cross	3
Oldenburg and Swiss cross	1
East Frisian	9
East Frisian and Wilstermarsh cross	2
Wilstermarsh	7
Wilstermarsh, Montafun, and Swiss cross	1
Wilstermarsh and other Holsteins	2
Wilstermarsh and mixed breeds	2
Cows of various breeds and Wilstermarsh bulls	1
Shorthorns	4
Shorthorns and Ayrshires	1
Shorthorns and mixed breeds	2

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	Estates.
Ayrshires.....	3
Swiss.....	5
Swiss with various crosses.....	3
Dantzic.....	1
Marzthal.....	1
Algau.....	3
Old German.....	1
Toudern.....	1
Mixed breeds of various races.....	9

PRODUCTS FROM DUTCH COWS IN SILESIA.

The following answers were received to inquiries addressed to two large estates keeping Dutch cows:

From the vicinity of Strehlen, midway between Breslau and the mountains.

Breed: Dutch, of pure blood.

Annual average quantity of milk: 2,800 liters.

Quantity of milk to pound of butter: 100 liters to 7 pounds.

Country of origin: Holland.

Size at maturity: 140 to 150 centimeters high.

Live weight: 1,000 to 1,200 pounds.

Age at maturity: Four years.

Weight at maturity: 550 to 650 pounds.

Color: Black and white.

Description: Broad chest, broad haunches, small neck and tail, horns curved forward.

Bred pure since 1872. We import 20 head of young cattle from Holland every three to three and a half years.

Labor: Valued at 48 cents per day.

Meat: Worth \$7.85½ to \$8.57 per cwt., live weight.

Milk: We get 2½ cents per liter from cheese factory.

Cheese: Worth at factory \$5.71 to \$5.95 per cwt.

Method of housing: In plastered stables.

Feeding: Nine months dry; three months green fodder.

Breeding: For dairy and fattening purposes.

From Masselwitz, on the Oder, a few miles above Breslau.

We keep an average of 60 cows, 2 bulls, 24 working oxen, and 15 to 30 slaughter oxen.

The cows are mostly Hollanders, with a few Silesians. They yield an average of 8 to 9 liters of milk daily. Fifteen liters of milk required for 1 pound of butter; 7 liters for 1 pound of cheese.

Cows at maturity are 140 to 150 centimeters high; weigh 900 to 1,000 pounds; are 50 to 60 centimeters across hips, and 40 centimeters across back. Fattened weight, 1,000 to 1,400 pounds. The color of Dutch cattle is usually black and white, but a few are also dun and white; head and tail small, horns curved inward.

The Hollanders were kept pure-blooded for ten years. Last year began crossing with Simmenthal bulls.

The milk is sold to city dairies for 2½ cents per liter.

The working oxen are of the Bavarian breed; red, large horns; quick gait; yoke on head.

Soil is partly loam, partly sand.

CENSUS AND DISTRIBUTION OF CATTLE IN SILESIA.

As already stated, the number of cattle in the province on the 10th of February last was 1,394,145. Of these there were in Upper Silesia 461,223, in Lower Silesia 412,653, and in Middle Silesia 520,269. In 1873, the number of cattle in the entire province was 1,351,431, consisting of 810,695 cows over two years old, 202,355 of these being used as working cattle in the fields; 139,042 calves under six months old; 296,714 young cattle from six months to two years old, including 11,208

bulls reared for breeding purposes; 13,809 bulls (breeding animals) over two years old, and 91,171 oxen over two years old. In 1861 the entire number of cattle was 1,060,501, including 684,842 cows over two years old. In 1840 there were 847,200 head of cattle, 510,475 being cows upward of two years old; and in 1816 the figures were 681,201 entire number, and 398,106 cows over two years. The proportion of cows to the entire number in 1883 I was unable to obtain.

HENRY DITHMAR,
Consul.

UNITED STATES CONSULATE,
Breslau, November 16, 1884.

CATTLE IN THURINGIA.

REPORT BY CONSUL MOSHER, OF SONNEBERG.

DESCRIPTION OF THURINGIA.

Thuringia is a mountainous district in Central Germany, lying in about 28° to 30° longitude, and about 50° to 51° 45' latitude. Its mean elevation is about 1,350 feet, and its mean annual temperature is about 6.5° Réaumur. The official record for Coburg (altitude, 902 feet) is as follows: December to February, -0.73°; March to May, 6.3°; June to August, 13.73°; September to November, 6.62° (Réaumur).

Quite one-half of this territory is covered with forests of spruce and fir, with occasional fine groves of beech, oak, and maple. The soil is sandy, with a substratum of clay-slate in the southeastern half and of porphyry in the northwestern. Fertile meadows and pleasant valleys abound throughout the district, which yield a good quantity of fine, sweet grass. The cultivated grasses are red clover and lucerne.

The inhabitants are classed as an agricultural people, but it is a noteworthy fact that nearly all the manual labor of the farm, the plowing, the sowing, the planting, the haying, the harvesting, and the shoveling, is done by the women, while the men are either in the army or are engaged in the manufactories for dolls, toys, slates, porcelain, and glassware, which abound in this region.

DESCRIPTION OF THE CATTLE OF THURINGIA.

Breeds.—The cattle in Thuringia embrace a variety of breeds, such as the Allgauer, the Heilbronner, the Frankish, and the Glau, all of which have sprung from the Bavarian race, which is itself an offspring of the Swiss-brown and the Fararberger breeds. For the purposes of this report it will be sufficient to confine attention to the Allgauer cattle, which are bred in Southern Thuringia towards the Bavarian frontier; to the Heilbronner breed, which is a cross of the red Simmenthaler (Swiss) and the Frankish cattle, being found most plentifully in the Dukedom of Meiningen; and to the Glau race, which is the prevailing stock in the more mountainous regions.

The Allgauer breed.—It is the concurrent testimony of all dairymen that no pure stock can be satisfactorily bred in Thuringia. The nearest approach to it is in the southern portion of the district, in the valley of the Itz, where the Allgauer cattle are found in the best condition. But even here there is a noticeable modification of the finer character-

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istics of the breed, as it is found in Frankish Bavaria. The head is borne less proudly, the eyes are less bright, and the horns are less symmetrical. The neck is short and stout, the back strong and rather long, the chest and rump broad, the body deep, the ribs barrel-shaped, the bag nearer square than round, the teats long and with a tendency to flatness, and the color varying from a dark brown to a whitish yellow. They are not dainty in respect to food, and easily adapt themselves to changes of location and diet. The cows of this breed reach a living weight of from 900 to 1,200 pounds. They average about 2,500 quarts (5,000 pounds) of milk per year, the milk being rich, and the quantity continuing without much variation until the animals are from twelve to sixteen years. While at pasture it is reckoned that about 10 or 11 quarts of their milk produce about 1 pound of butter, while in winter from 12 to 15 quarts are necessary. It is also estimated that with these cows 100 pounds of hay produce 25 quarts of milk and 2½ pounds of butter.

The Heilbronner breed.—The Heilbronner cattle, which appear in Meiningen, are excellent milk-givers, some of them producing as many as 16 quarts daily, but the average is about 10 quarts. The milk is rich, and they can usually be milked until about four weeks before the time of calving. On an average about 10 quarts of their milk is required for 1 pound of butter or for 5 pounds of cheese. They are more compact than the cattle of the Allgauer breed. Their color is not uniform, but varies from a dark red to a yellowish hue. They have a well-shaped body, a deep and broad chest, a heavy rump, a smallish head, bright eyes, short, smooth, whitish horns, fine hair, symmetrical legs, and a brisk motion. They weigh from 750 to 1,000 pounds, the ox being about 300 pounds, and the bull 500 pounds heavier than the cow.

The Glan breed.—The Glan cattle, which are really the cattle of the country, are somewhat rougher-looking animals than either of the breeds already mentioned, and this is doubtless owing, in part, to the less favorable circumstances in which they live. Their origin is respectable, since they came from pairing the red Swiss with the old and now extinct native Thuringian cattle, but hard usage and a somewhat rigorous régime have eliminated many of the finer qualities of their ancestors. They are stout, rough-haired, dirty-hued, unintelligent-looking animals, varying in size from that of the compact Jersey to the average American ox. The weight of the cow is from 700 to 1,000 pounds, the ox 1,100 pounds, and the bull 1,400 pounds. They are supposed to attain their maturity at the age of five years, but they show no failure of strength and productiveness until they are from eleven to fifteen years old. They average about 9 quarts of milk and one-half pound of butter per day.

SIZING CATTLE IN THURINGIA.

Cattle are sized in this country by taking their height from the ground to the top of the fore shoulder, as horses are sized in most countries. The girth is never taken into account. The Allgauer and Heilbronner cow stands about 140 centimeters (4 feet 2 inches), and the bull and the ox about 150 centimeters (4 feet 6 inches). The Glan cow stands about 145 centimeters, and the ox and bull about 155 centimeters.

COWS AS DRAFT-CATTLE.

A noticeable feature of industrial life in this region is the almost universal use of the cow as a draft animal. In the labor of the farm

women take the place of men and cows the place of oxen. Comparatively few horses and oxen are seen, but nearly every family, especially in the country and small villages, owns at least one cow, and they use them, either singly or in pairs, for all kinds of draft-work. Instead of a yoke, a narrow piece of wood passes across the forehead, just beneath the horns, to each end of which a chain or leather trace is attached, passing thence through lug-holes in a surcingle around the waist to whipple-trees that are fastened to the load. Thus the strain comes upon the forehead and neck. The cows wear iron shoes like oxen. They are worked the year around, their owners claiming that it makes but little difference in either the quantity or quality of their milk. All grades of cattle are used in this way, even the dainty Allgauer being sought by many farmers primarily on account of their powers as draft-animals. Such usage through many generations has, I think, produced a kind of masculine grossness and stoutness in the cows which is not noticeable in their native homes and normal condition.

HOUSING CATTLE IN THURINGIA.

The ordinary cattle-barn is a long, low, stone building, with a stone floor, a 6 to 8 foot post, a vaulted ceiling, and space in the roof for storing fodder. But it is a very common thing to find only one building on the farm, the family occupying one end of the basement and the cattle the other, with the fodder in the loft. Or the whole basement may be given to the cattle, the family and the fodder sharing the second floor between them; or else the family takes the whole of the second story and sends the fodder into the attic. There is a movement against this practice, especially in the larger towns and among the insurance companies, because it is believed to be responsible for very many fires. The bedding most in use is, in the few large cities, straw; but in the country and most of the towns and villages it is the newly-grown part of the spruce and the fir, chopped fine, the coarser part of the branches being retained for fire-wood. It is claimed that this kind of bedding is subsequently valuable as a dressing for the land.

CATTLE-FEEDING IN THURINGIA.

The methods of feeding are quite similar in all parts of the district. The cattle are usually fed three times a day, and the bill of fare embraces hay, straw, "scalded food," and occasionally turnips. The allowance for each cow is an equivalent of 25 pounds of hay daily. The hay embraces red clover, lucern, and the native grass of the country, which is of a fine, nutritious quality, and is usually cut two and three times between June and October. The straw (oat, rye, and barley) is generally chopped, and about two-thirds more in weight is allowed than of hay. The "scalded food," which is used much in dairies and in cold weather, consists usually of rye-bran broth or of a thin mixture of oatmeal and water, which is supposed to stimulate the milk-producing powers. Owing to the use of the cows as draft-animals, pasturage, as it is practiced in most countries, is almost unknown here.

BREEDING CATTLE AND HANDLING THEIR PRODUCTS.

There is no "gentle breeding" of stock in this region. No calf is "born to the purple," unless it may sometimes happen to be the offspring of a favorite animal on some one of the two or three "model farms" which are under ducal patronage and direction; but each one, if he

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escapes the butcher's knife while he is of tender age, must, as a rule, serve an ignominious apprenticeship in the traces, preparatory to being hitched to the plow or to some other wearisome load. There is rarely ever a warm place prepared for the cow at the interesting periods of her life, and the calf, dropped upon a cold stone floor or upon a bed of needle-like spruce tips, may consider itself fortunate if it is allowed to feed in the natural way the first fortnight of its existence, before being brought to the skimmed-milk trough or to the sour-milk bucket.

But I should say that there are several "model farms" in the district, where the best Swiss stock is kept and where the housing and care are more comfortable. Even here the verdict is that the best-blooded stock will not breed pure, and that the cross between the Frankish and Simmenthaler cattle gives the best results.

The treatment of the calf is about as follows: Sweet milk until the eighth or ninth week, in daily quantities of about one-fifth the weight of the calf, with one-half pound of coarse oat-meal and 1 pound of hay in the ninth week; in the tenth and eleventh weeks, about 14 quarts of milk, 2 pounds of coarse oat-meal, and 5 pounds of hay daily; in the twelfth week eight quarts of milk, 4 pounds of oat-meal, and 10 pounds of hay daily; in the thirteenth week, 4 quarts of milk, 3 pounds of oat meal, and 10 pounds of hay daily, by which time the calf is supposed to be able to gradually abstain from all liquid food and to confine itself to grass and hay.

THURINGIAN BUTTER AND CHEESE.

Very little cheese is made in Thuringia, the reason being that it is considered more economical to sell or consume butter and milk, which are eaten very freely, and buy cheese from Holland and Switzerland. Cheese-making was tried a few years ago at the Rosenau farm, in Southern Thuringia, but it was soon given up for lack of satisfactory results. The ordinary Swiss cheese retails here at 30 cents a pound. Milk retails at about 4 cents a quart and butter at 30 cents a pound. Taking all cattle together, the average yield of milk is about 2,400 quarts yearly for eleven years. This would represent a money value of about \$1,056. Ten quarts of milk are supposed to yield 1 pound of butter, which would represent a money value of \$792.

RESULTS OF BREEDING IMPORTED STOCK.

It is generally held that imported breeds, such as Holsteins, Short-horns, and Jerseys are superior in the United States to what they are in their native homes. Such a result is not obtained in this country, but I am convinced that this is owing quite as much to lack of proper location and treatment as to any other cause. Such stock is almost never "trained for condition" here, and the indifferent treatment which it receives, and the hard work to which all grades of cattle are put, do not furnish suitable data for judging what any breed is capable of becoming. The most that I feel warranted in saying is, that there is no breed here whose present condition, whatever may have been its antecedents, would warrant the experiment of importing them into the United States.

DISTRIBUTIVE STATISTICS.

The population of the district under consideration is about 1,800,000, and the number of cattle is estimated at 475,000, of which 10½ per cent. are of the Allgauer breed, 10½ per cent. of the Heilbronner breed, 31½

per cent. of the Frankish breed, and 47½ per cent. of the Glan breed. It is difficult to say what percentage is bred for the dairy, because the stocks have for a long time been selected with quite as much reference to their powers as draft-animals as to their dairy qualities. All through the rural districts the cow *must* be a good draft-animal, and then the more milk she gives the better. It cannot be said that positively bad results have attended this method of selecting cattle, for, while the cows quite generally supersede oxen and horses in farm-work and in miscellaneous drawing, they yield a good average quantity of rather rich milk. The stock of cattle is just about equal to the home demand for food, but that is because the people are large bread-eaters rather than great meat-eaters. The most of the meat is eaten in the villages and large towns. The flesh is fairly good, but it is not remarkable either for its sweetness or its juiciness. The demand for beef is lessened by the amount of sausage and other swine-flesh that is consumed.

The accompanying table presents the main facts of this report in a more compact form.

GEORGE F. MOSHER,
Consul.

UNITED STATES CONSULATE,
Sonneberg, November 10, 1883.

SPECIAL STATISTICS CONCERNING THURINGIAN CATTLE.

Allgauer, Heilbronner, Frankish, and Glan, all going under collective name of Frankish cattle. The annual average production of milk is 4,800 pounds; 10 to 12 quarts make 1 pound butter, and 10 to 12 quarts make 5 pounds cheese. The size at maturity is: Cow, 142 centimeters; bull, 149 centimeters; ox, 152* centimeters. Live weight is: Cow, 750; bull, 1,250; ox, 1,300. Age at maturity, 5 years. Weight of meat at maturity: Cow, 450; ox, 1,000; bull, 950. Color, dark brown to yellowish. Description: Head short and wide; eyes bright; horns short, smooth, whitish, with black points; neck short and stout; back strong, long, and level; ribs barrel-shaped; body deep; rump heavy; tail slender; bag long, squarish, and clean; teats long and flatish. Pure breeding not successful and hardly exists. Cross between Simmenthaler and Frankish probably one hundred and fifty years. Origin of breed is Swiss through Frankish or Bavarian channel. Product: Labor, \$500 to \$2,500; meat, \$75; milk, \$1,056; butter, \$792.

Topography: Altitude, 1,350 feet; mean temperature, 6.5° Réaumur; summer, June to August 13.72° R.; winter, December to February, -0.73° R.

Substratum: Porphyry and clay, slate, gravel, &c.

Cultivated grasses: Timothy, red clover, and lucern.

The cattle are housed in stone barn, stone floor. The equivalent of 25 pounds of hay, daily (hay, chopped straw, scalded food), is the food. Breeding not carefully attended to. Stock is handled rudely and not with care to best results. Flesh consumed in district. Milk and butter sold at market or consumed at home.

VOIGTLAND CATTLE.

REPORT BY CONSUL BULLOCK, OF ANNABERG.

In Saxon-Voigtland, in the consular district of Annaberg, cattle-raisers give much attention to the Voigtland race of cattle, which long experience has proven to be well suited to the climatic conditions prevailing here. This breed of cattle has its home in Saxon and Bavarian-Voigtland, that is, in Southwest Saxony and the Bavarian Ober-

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VOICELAND COW



Julius Rosen & Co. Lith.

VOIGTLAND COW



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VOIGHTLAND COW





VOIGHTLAND BULL

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of 1882.

ANNABERG

Pfalz. Voigtland is a well cultivated highland, with an average elevation of 1,300 feet, and an annual mean temperature of 48° Fahrenheit. The annual rainfall is 29 inches, and the time between the first and last snowfall of the year is about one hundred and fifty days.

ORIGIN OF THE BREED.

In the early part of the present century Zillertal (Tyrol) cattle were brought into Voigtland, and the origin of the present breed of Voigtland cattle dates from the time of this cross.

CHARACTERISTICS.

The following are the distinguishing features of this race of cattle: The body color is chestnut-brown, without marks; the tuft of the tail yellow, and udder bright red. Bright red is also the color of the membrane of the eyelids, of the tongue, and of the mouth. The body is long and well arched, the back broad, with full thighs, and the hide is thick and soft. Average live weight, 750 to 850 pounds. Yearly milk production, 375 to 400 gallons. The cattle of this race are very hardy and are easily fattened, and are much sought after for beef. They are, however, not of rapid growth.

The measurements of a bull and seven cows of the Voigtland race gave the following results:

Lines of measurement.	Bull.	Cows.
	<i>Inches.</i>	<i>Inches.</i>
Line between horns	6½	6
Narrow part of forehead	7½	6½
Broad part of forehead	7½	9
Chest	6½	6½
Length of head	17	17

Plate 1 shows the head of a three-and-a-half-year-old bull; Plate 2 the head of a four-year-old cow, with the following measurements:

Lines of measurement.	Bull.	Cow.
	<i>Inches.</i>	<i>Inches.</i>
Line between horns	5	4½
Narrow part of forehead	7½	6½
Broad part of forehead	9½	8½
Length of head	17½	17½
Height of back	48	47½
Height of rump	49½	49½
Length of trunk	48½	47½

Plate 3 shows a Voigtland cow exhibited at the Bremen cattle-show of 1882.

GEO. E. BULLOCK,
United States Consul.

ANNABERG, April 30, 1884.

CATTLE-BREEDING IN WURTEMBERG.

REPORT BY CONSUL CATLIN, OF STUTTGART.

CATTLE CENSUS OF WURTEMBERG.

A cattle census made throughout the Kingdom of Wurtemberg, on the 10th day of January last, showed that there were in the Kingdom on that day 904,139 head of cattle, valued at 169,425,318 marks (about \$40,000,000), and weighing in the aggregate 534,212,296 pounds. They were subdivided in age and sex as follows:

Description.	Number.	Weight.	Value.
Calves under 6 weeks.....	34, 185	<i>Kilos.</i> 1, 580, 505	<i>Marks.</i> 1, 049, 069
Calves 6 weeks to 6 months.....	98, 200	8, 213, 422	6, 040, 615
From 6 months to 2 years.....	211, 262	42, 412, 011	27, 399, 161
Bulls and oxen, 2 years and over.....	*100, 755	47, 584, 915	29, 532, 753
Cows.....	459, 737	167, 315, 293	105, 402, 690
Total	904, 139	267, 106, 148	169, 425, 318

* Including 7,524 breeding bulls.

The population of the Kingdom (see census of 1880) was 1,971,118; its area is 7,675 square miles. There is, therefore, one head of cattle to every 2.18 of population, and 117.8 head of cattle to every square mile of area.

There are to be found in the Kingdom, in all, five principal breeds: the Simmenthaler, Montafoner, Allgauer, Limburger, and Neckarschlag; the two first of which are imported, the others native stock.

THE SIMMENTHALER BREED.

As early as the middle of the last century the importation of Simmenthaler cattle from Switzerland into Wurtemberg began, though at first in small numbers. This breed derives its name from the valley of the Simme, from which locality it seems originally to have sprung, though most of those at present purchased come from the Canton Glarus, and some from the vicinity of Berne. Dr. Von Rueff, director of the Royal Veterinary School in this city, in his work on "Die Racen des Rindes," thinks that many indications point to this breed as the future one for Germany, and this opinion gains all the more weight from the fact that the Simmenthaler race, better than any other, fulfills all three of the conditions (breeding, milk, and labor) requisite to good cattle. Many Wurtemberg agricultural associations, including those at Stuttgart, Ludwigsburg, Heilbronn, Urach, Münsingen, Kirchheim, Nürtingen, Rottweil, Balingen, Marbach, Warblingen, Vaihingen, Rottenburg, and Tübingen, use the Simmenthaler breed for the improvement of their stock.

Weight and food.—According to a statement made by Professor Rau, of Hohenheim, and covering the period from 1838 to 1856, the Simmenthaler cattle at that place had an average weight (on the hoof) of 1,306 pounds, and an average yearly yield of 2,570 kilos of milk to a daily average consumption equivalent to 37 pounds of hay. According to a previous reckoning made at the same place the average weight of the

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cows was 1,300 to 1,350 pounds, and of bulls, 2,200 to 2,300 pounds on the hoof. The ten-months cattle of this breed are found to consume an average of 19.15 pounds of hay, and gained during six months' daily observation 1.135 pounds in weight per day. Of summer fodder, *i. e.*, red clover, lucern, and bran, the one-and-a-half-year-olds consumed 26.73 pounds (estimating $4\frac{1}{2}$ pounds of grass, clover, &c., to 1 of hay), and gained daily 1.98 pounds in weight. The older cattle consumed exactly 3 pounds of stall-fodder to every 100 pounds of their own weight. To keep the fully grown stock in good condition, however, only the equivalent of $1\frac{1}{2}$ pounds of hay for every 100 pounds of their own weight should be fed them.

Animals from three months to one year old are fed daily 19 pounds to an average weight of 475 pounds, *i. e.*, about 4 pounds for every 100 pounds of weight.

Cattle in their second year are fed daily 22 pounds to an average weight of 700 pounds, *i. e.*, about 3 pounds for every 100 pounds of weight.

Cows while with calf, and in their third year, are fed 28 pounds to an average weight of 1,000 pounds, *i. e.*, $2\frac{1}{2}$ pounds for every 100 pounds of weight.

There is reckoned to every 100 pounds of fodder an average increase in value as follows: Cattle of both sexes, 3 months to 1 year, 7.94 pounds; cows, 1 year to 2 years, 6.12 pounds; cows (in calf) in their third year, 3.82 pounds.

As the result of observations conducted for one year, it has been found that the Simmenthaler cows average 7,294 pounds of milk and one calf, averaging 96 pounds weight, per annum. In a year, subdivided into 174 days of winter fodder, 134 days of summer fodder, and 57 days of autumn fodder (365 days in all), they average 17,193 pounds of fodder, or $47\frac{1}{2}$ pounds daily; or, on an average weight of 1,500 pounds to the animal, 3.14 pounds of fodder to every 100 pounds of weight.

On a basis of 100 pounds of fodder to every 6 pounds of calf produced, there may be reckoned also $45\frac{1}{4}$ pounds of milk for every 100 pounds of fodder. The Simmenthaler milk produced at Hohenheim yields 12 to 15 per cent. of cream, and contains, according to chemical analysis, 11 to 13 per cent. of solid substance.

Characteristics of Simmenthaler cattle.—The distinguishing characteristics of the Simmenthaler cattle are as follows: Small, light head, with gentle, lively expression, and fine horns pointed well forward and upward, and in most cases rather flat at the roots, more oval than round in form, and in the bulls often somewhat rough, and pointing backward and downward. Neck fine, rather short, with a strong dew-lap; body well rounded at the ribs and locked at the loins. The hind quarters are broad and long and frequently with prominent caudal bone. The latter characteristic, though a natural one in the races of mountain cattle, is much condemned by many in Germany, though it involves no real ground for prejudice to the animal. The fundament is very low and remarkably regular, the upper parts are strongly provided with muscles, the parts under the knees are fine, and the hoofs well made and hard. The udders are well formed, though not giving the same flow of milk found in the German cows. The hide is in some cases very fine and tender, but in many others very coarse, with rough hair and with a somewhat bullish look. In this respect a marked difference declares itself between the Simmenthaler breed and the Frutiger breed, and its explanation is found in the varied conditions of pasturage and

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climate. The disposition of the animals of this breed is remarkably good-natured, almost playful. Their gait is very broad and sure, one might almost say graceful. The weight on the hoof averages, in the pure Simmenthalers, about 1,400 pounds, and in the stocks bred from them 1,000 to 1,200 pounds.

THE MONTAFONER BREED.

This, the second-mentioned imported stock in Wurtemberg, is one developed from the Schwytzer stock by breeding, and further by change in climate, pasture, and conditions of soil. The Montafoner cattle are lighter than the Schwytzers and heavier than the Allgauer, the cows averaging about 1,000 to 1,200 pounds. Their color is black or dark brown, with the same characteristics as the Schwytzer breed, namely, the mouth shaped like a deer, light-shaded stripes over the back and light tufts of hair in the ears; the head is short, with wide forehead, and the horns white only at the base, the remainder being black; the neck is short and compact, with thick folds; the shoulders are broad and the back has a tendency to curve downwards. The haunches are also broad; the caudal bone often too high; the limbs compact, stout, and the udders large. In good cows the annual yield of milk is as high as 1,900 liters, and of a quality giving 9½ pounds of butter and 16½ pounds of cheese to every 100 liters. The oxen are tough, good for hauling, and are quite easily fattened, but give a coarse-fibered meat. The original home of this breed is in the Montafoner Valley, which opens into the valley of the Upper Rhine, a few hours distant from the Lake of Constance. Inasmuch as the Montafoner cows are not so fastidious as many others in regard to fodder, they are much used in Wurtemberg for crossing in localities where sour grasses abound, as, for instance, at Waldsee, Ehingen, Tettnang, and Saulgau. In general the Montafoner breed may be said to be easy of acclimation.

THE ALLGAUER BREED.

This breed is to be classified among the dark-brown mountain cattle, and is the smallest and most varied in shade of them all. It is principally found in or near the Swabian Alps, but owing to its usefulness has spread over the lowlands as well, is found in considerable numbers in the neighborhood of Wangen and Isny, in this Kingdom, and is imported in large numbers for breeding purposes to Saxony, Baden, Prussia, Bohemia, Poland, and Hungary.

The cows average 800 to 900 pounds in weight, and vary greatly in color. The head is small and handsomely formed; the mouth black and broad; the horns white at the base and black at the point; the neck short, with good and well-defined folds; back and haunches broad and compact; caudal bone generally high, but not so frequently rising above the level of the back as in the case of the Simmenthaler and Montafoner breeds; the chest, as is generally the case with good milch cows, is not very wide or deep, for which reason many Allgauer cattle are complained of as being hollow shouldered; the ribs of the belly are, however, wide; the belly itself is broad and deep, and the whole frame muscular and compact. The oxen are strikingly large in comparison with the cows and bulls, and the calves when born are also disproportionately large. Cows weighing 700 to 800 pounds, and consuming a daily average equivalent to 25 pounds of hay, yield 1,900 liters of milk per annum.

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It takes 10 liters of their milk to make 1 pound of butter. According to a comparative trial made in Saxony the Allgauer cows produced 29.38 liters, the Holland cows 25.26 liters, and the Saxon cows only 23.16 liters of milk to every 100 pounds of hay, or its equivalent, consumed. The meat of the Allgauer breed, on the other hand, is less valuable than that of the other breeds mentioned, its fiber being coarse, dry, quite red, and very tough.

THE LIMBURGER BREED.

Under this title two breeds exist, one originating in the province of Limburg, in Belgium, the other, and the one which this report more properly concerns, in the neighborhood of Schwäbisch Hall, in Wurtemberg. This latter breed is found most in use in the vicinity of Gaildorf, Aalen, Gmund, and on the estates of Count von Rechberg and Baron von Wollwarth. Their color is tawny-yellow, pea-yellow, and silver-yellow (*silberfalb*), mostly without any marks; the skin is fine, so that it not only falls in graceful folds upon the neck, but also frequently in transverse folds. As distinguishing marks of the race may be mentioned yellow horns and hoofs; as well as flesh-colored and almost hairless skin around the eyes. The head is long, narrow, light, and in many cases with curved profile; the horns fine, round, and in most cases projecting upwards and forwards. The chest is but little developed; the shanks generally flat, with but few muscles, and ungainly in shape. It is a light country breed, giving a good yield of milk, and, moreover, noticeable on account of the fine fiber of its beef. The cows are very small in comparison with the oxen bred from them, weighing only 600 to 700 pounds, while the oxen weigh as high as 1,500 to 1,600 pounds on the hoof. The cows give about 1,800 liters of milk per annum, 10 pounds of the milk giving about 1½ pounds of butter.

THE NECKAR BREED.

This is a race special to Wurtemberg, having its origin in the neighborhood of Heilbronn on the Neckar, whither, as long ago as the end of the last century, bulls were imported from Bern for crossing with the native stock, but later this crossing was carried on in such a manner that an especial value came to be attached to the thoroughly red cattle, resulting in the development of an intermediate breed, rarely parti-colored, which now widely exists in the counties of Heilbronn, Neckarsulm, and Leonberg. It was formerly much easier to obtain cattle of the single color from the Simmenthal region, inasmuch as here, as everywhere, the effect of prevailing fashion in cattle-breeding made itself felt, though, of course, limited somewhat with reference to the animal's usefulness. Thus, for instance, Ryehner relates that formerly in the Canton Bern only red cattle were in demand, while later, a demand suddenly sprung up for parti-colored ones, even though the latter were prejudicial to trade. Formerly only delicately made cattle were sought for; afterwards they could not be found coarse enough. For years past the Neckar breed has maintained its pure red color, with a large and somewhat heavy body and low belly. Its form, as regards the head and horns, is lighter than is found in the breeds sired from Swiss bulls. The folds of the flesh are thick; the breast finely developed, and the hanches regular, with a much better caudal bone than is found in the Simmenthalers. The bones are short, the hind legs somewhat curved,

and the skin rather thick. A cow on the hoof averages 1,000 to 1,200 pounds weight. This breed gives a better quality of milk, and a tenderer beef than the Simmenthaler. The oxen are also much in demand as draft animals, and can be fattened to a weight of 1,800 pounds. Calves when born are generally large and heavy.

PRICES OF WURTEMBERG CATTLE.

The average price at which a bull or a cow of the five breeds above described can be purchased in the localities where they respectively originate is as follows:

Breed.	Bull.		Cow.	
	* Marks.	Marks.	* Marks.	Marks.
Simmenthaler	600	500	450	350
Allgauer	450	350	300	200
Montafener	500	400	350	250
Limburger	500	400	350	250
Neckar	450	350	300	200

* The mark equals 23.8 cents.

WEIGHT OF WURTEMBERG CATTLE.

The average weight of a bull, ox, and cow of the five different breeds, when slaughtered, is as follows:

Breed.	Bull.		Ox.		Cow.	
	Kilos.	Kilos.	Kilos.	Kilos.	Kilos.	Kilos.
Simmenthaler	600	500	450	350	300	200
Allgauer	400	350	300	250	200	150
Montafener	500	400	350	250	200	150
Limburger	550	450	350	250	200	150
Neckar	400	350	300	250	200	150

CATTLE-BREEDING AT THE AGRICULTURAL SCHOOL AT HOHENHEIM.

In the preparation of this report I have made it my duty to visit the agricultural school at Hohenheim, about 5 miles to the eastward of this city, and long and widely known throughout all Europe as one of the foremost institutions of its kind on the continent. The school occupies a large collection of buildings, which were built as a residence for the Duke Karl, of Wurtemberg, about one hundred years ago, and is surrounded by spacious farm lands devoted to the practical exemplification of the instruction given in the various branches of agriculture. Prominent among the branches to which attention is given is cattle-breeding, which is here carried on systematically and on the latest scientific principles. I was much gratified by being enabled to make a personal inspection of the fine collection of Simmenthaler stock, some eighty or ninety in all, forming the finest collection in Wurtemberg and probably one of the finest in Germany. Through the kindness of Professor Dr. Vossler, a leading and efficient member of the faculty, I am so fortunate as to have been placed in possession of a great variety of interesting information on this and kindred subjects. I subjoin herewith Professor Vossler's answers to my various questions as follows, viz:

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Question. How many breeds of cattle are to be found in Wurtemberg? Which are native and which imported?

Answer. The breeds of cattle in Wurtemberg may be classified as follows, viz:

NATIVE.

Yellow and red (of which but few exist).—(1) Alb; (2) Teck; (3) Schwabisch Hall; (4) Limburger; (5) breeds (principally the Neckar race) resulting from crossing of the foregoing breeds with others, chiefly with yellow, red, and parti-colored Simmenthalers.

Grayish brown.—(6) Allgauer; (7) breeds resulting from crossings of Allgauer with Schwitzers, Montafoners, and Simmenthalers.

IMPORTED.

Red and spotted.—(8) Simmenthaler.

Grayish-brown.—(9) Montafoner; (10) Schwitzer (Rigi).

Lowland breeds.—(11) Hollander (striped).

MISCELLANEOUS.

(12) Ansbacher (Triesdorfer); (13) Durham; (14) Gurtenvieh; (15) the White Rosenstein stock from the royal grounds at Rosenstein.

Question. Do the imported breeds, when suitably located and managed, produce in Wurtemberg offspring superior to that produced by the same breeds in their original homes; and, if so, is this superiority more marked in the succeeding generations than in the first?

Answer. The breeding capacity of the Simmenthaler and Montafoner races remains about the same, while in the case of the striped cattle the yield of milk often diminishes somewhat.

Question. Which would be the best method for exporting these breeds from Wurtemberg to the United States?

Answer. Young cattle from good stock might probably be exported, provided care were taken that young calves and cows in calf were not subjected to great suffering on the sea voyage, and that the costs of transportation were not too high.

Question. What is the average purchasing price paid for a bull and a cow in the original home?

Answer. For animals of the two races principally imported for renewing and improving the native Wurtemberg stock, the following prices are paid, viz:

Description.	Age.	Weight.		Prices.
		Years.	Kilos.	Marks.
Simmenthaler:				
Bull	1½	600		1,200
Cow	2	900		1,000 to 1,600
Montafoner:				
Bull	1½	550		600
Cow	2	450		400

Question. What is the estimated value in Wurtemberg of a good bull, ox, and cow of each breed?

Answer. Of the Simmenthaler breed, a bull, 300 to 1,000 marks; an ox, 400 to 600 marks; and a cow, 300 to 600 marks. Of the crossed breeds, a bull, 200 to 500 marks; an ox, 300 to 600 marks; and a cow, 200 to 400 marks.

Question. What is the estimated number and value of cattle in Wurtemberg per breed, according to the last census?

Answer. According to the enumeration made without regard to race, on the 10th of January, 1883, there were in Wurtemberg, of the cattle comprised in this enumeration, about two-thirds Simmenthalers and crossings of Simmenthalers with native stock, and the remainder of Allgauer and crossings with them.

Question. What percentage is bred for the dairy and the butcher?

Answer. There are no cattle exclusively raised as beef cattle in the Kingdom. Calves from eight days to four weeks old and unfit for breeding, old cows and bulls and oxen, which have been fattened after having served as draft animals for several years, are sent to the butcher.

Question. Does the stock increase or decrease, and what is the cause?

H. Ex. 51—29

Answer. The stock of cattle increases, but that of sheep decreases, as will be seen by the following statement:

Year.	Cattle.	Sheep.
1840.....	825,707	676,607
1883.....	804,139	550,104
Increase.....		
Decrease.....	78,442	126,501

Question. Is the stock of the country sufficient for home demand, and if there is a surplus, what becomes of it?

Answer. In proportion to area and population, Wurtemberg is the largest cattle-growing section of Germany. The ratio for all Germany is 29.2 cattle to every square kilometer and 35 cattle to every 100 inhabitants, whereas in Wurtemberg it is 48.5 to every square kilometer and 47 to every 100 inhabitants. The surplus is exported principally to France (as beef), to Bavaria, and to North Germany (for breeding and draft purposes). The export from Upper Suabia and the Black Forest generally goes to Switzerland. Importations, and those only for breeding purposes, are made principally from Switzerland, and very few from Holland.

Question. Which section of Wurtemberg is most favorable for grazing and cattle-breeding?

Answer. Strictly speaking a regular system of pasturage is only found in the Allgau region (counties of Wangen and Leutkirch), but the conditions necessary to cattle-breeding are everywhere favorable. The places at which the breeding of Simmenthals and breeds crossed from them is conducted most systematically and carefully are Rottweil, the Folders, Hohenheim, and in the vicinity of Heilbronn.

Question. What proportion of the population is engaged in cattle-raising and agricultural pursuits?

Answer. About 48.2 per cent. of the population are employed in such pursuits, including cattle-breeding and the dairy business.

STABLING, FEEDING, AND BREEDING.

Stabling.—The stables in use are generally strongly built ones, in which the cattle are tied to the fodder trough. Stalls in which the cattle can walk about are seldom used, and then only for younger animals. Dung is removed daily.

Feeding.—Calves up to twelve or fourteen weeks are fed on milk. But little prepared and much cut fodder is given. In summer in the stall green fodder is given. Pasturage is found only in the Allgau region.

Breeding.—In the main carefully conducted. Stock is renewed by the purchase of foreign bulls. Bulls are officially inspected. About 20 thoroughbred bulls are annually sold from Hohenheim.

BULL-KEEPING AT KIRCHHEIM UNDER TECK.

In the course of my inquiries on the subject, I have had occasion, upon the courteous invitation of Oberamtmann Loefflund, president of the Agricultural District Association at Kirchheim under Teck, to visit that town, the center of a fertile and prosperous grazing district, distant about two hours from Stuttgart, and to inspect the system of bull-keeping as conducted there for years past. The result may be summarized as follows:

Statement showing
maintaining
of five years

EXPENSES

Purchase-money
Fodder.....
Straw.....
Treatment.....
Stable expenses
Salt.....
Costs of sale....

Total.....

RECEIPTS

Service of bulls
Dung and gütte

Total.....

Excess of expenses
receipts.....

* To this should
1,748.19 marks in

Altitude: 310
point in the district
Mean temperature
Summer: (in July)
January: Celsius
Soil: Alluvial
slides. Loam
everywhere.
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Statement showing the annual and aggregate costs, expenses, and losses of purchasing and maintaining six breeding bulls at Kirchheim under Teck, in Wurtemberg, during a period of five years.

	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.	Total.	Yearly average.
EXPENDITURES.	<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>
Purchase-money	1,290.00	678.75	1,040.25	1,423.20	887.00	5,828.80	1,065.76
Fodder	1,870.28	1,521.88	1,393.45	1,517.44	1,421.01	7,733.06	1,546.61
Straw	452.10	240.93	201.08	817.81	459.08	1,740.94	348.10
Treatment	30.70	12.00	14.10	17.60	5.23	79.60	15.94
Stable expenses	37.60	46.60	16.87	14.50	24.07	143.22	28.66
Salt	14.00	12.00	14.40	11.20	16.00	67.60	13.52
Costs of sale	10.64	6.70	7.60	13.96	6.76	45.66	9.13
Total	3,724.37	2,530.05	2,748.79	3,815.71	2,810.15	15,138.97	3,027.81
RECEIPTS.							
Service of bulls	1,564.00	718.00	790.00	1,714.00	913.00	5,699.00	1,139.80
Dung and guttle	640.20	517.10	578.40	523.80	539.60	2,799.10	559.82
Total	2,204.20	1,235.10	1,368.40	2,237.80	1,452.60	8,498.10	1,699.62
Excess of expenditures over receipts	1,520.17	1,295.85	1,380.39	1,077.91	1,368.55	6,640.87	*1,328.19

* To this should be added the amount paid the bull-keeper for services, 420 marks, making a total of 1,748.19 marks in all.

TOPOGRAPHY OF KIRCHHEIM UNDER TECK (WURTEMBERG).

Altitude: 310 meters (1,017 English feet) above the level of the sea. The highest point in the district is 810 meters above the level of the sea.

Mean temperature: (Yearly average): Celsius, 8.8°; Réaumur, 7°; Fahrenheit, 48°. Summer: (in August): Celsius, 17.6°; Réaumur, 14°; Fahrenheit, 64°. Winter (in January): Celsius, -1.5°; Réaumur, -1.2°; Fahrenheit, 29°.

Soil: Alluvial. The valley bottoms are partly filled with soil from the mountain slides. Loam everywhere predominates, and rarely mixed with sand. Clay is found everywhere. In the lower, brown jura sand is very plentiful, as the product of sandstone.

CATTLE-BREEDING AT ROTTWEIL.

Among the points in the Kingdom where cattle-breeding has been carried on scientifically, with more or less success, is the neighborhood of Rottweil, a flourishing town in the Black Forest section. With a view of obtaining such information as was practicable in that quarter on the subject embraced in this report I addressed a letter of inquiry to Oeconomierrath Burkhardt, president of the Rottweil Agricultural Association, and received the following reply:

ROTTWEIL, October 21, 1883.

In reply to your favor of the 19th instant I have the honor to state as follows: The county (district of Rottweil) has for many years past ranked among the foremost in regard to cattle-breeding. Although the sale of animals for breeding purposes is always a very considerable one, and the extraordinarily high prices obtained for choice stock result in the sending elsewhere of the finest specimens, yet no reaction is noticeable. Bred since forty years in one direction (crossing with the Simmenthaler) a homogeneity of race has been developed, so that experts at once recognize the animals, even when exported to long distances, as the "Rottweil" breed. A very efficient cause of the present condition of our cattle-breeding may be mentioned, the keeping of township bulls as practiced in the district for forty years past.

For the renewal of stock, which takes place every three or four years with original Simmenthaler bulls (no cows have been imported for twenty years past), only well-built and delicately-shaped specimens are selected, the thick-skinned, hollow-shouldered, heavy breed, that yields little milk, having for a long time been abandoned.

In consequence of the system of cattle-shows with premiums, introduced by the centralstelle for agriculture, a considerable progress in cattle-breeding has been noted in Wurtemberg. As at present in the district of Rottweil the hoof disease—showing,

however, no malignant symptoms—prevails quite generally, the present moment would be unfavorable for an inspection.

I have had the honor to state herewith that which is in general most essential concerning cattle-breeding in our district, and I leave it to the consideration of your honor to favor us perhaps at some other time with a visit.

With highest regards,

Oeconomierath BURKARDT,
President of the Agricultural Union.

CATTLE-BREEDING AT KIRCHBERG.

At Kirchberg, in the Black Forest section, great attention is paid to cattle-breeding, and several distinctive points of interest in connection with the subject will be found in the subjoined letter from Oeconomierath Schoffer, the president of the Royal Farming School at that point, who writes me, under date of October 22, as follows:

KIRCHBERG, NEAR SULZ, October 22, 1883.

In answer to your favor of the 19th of October I have to say that the breed of cattle stalled here is identical with that kept at the Royal Academy at Hohenheim, and that in regard to the rearing of young cattle only this difference exists, viz, that in Kirchberg a thorough system of grazing is carried out. Near the farm buildings there are two inclosures of about 3 hectares each, provided with facilities for watering the animals, where the young cattle, from spring (about May 10) until the end of October, graze without the supervision of herdsmen. So long, during spring and autumn, as the nights are cool and flies not troublesome the animals go out at dawn to graze, returning in the evening to their stalls, where they are daily washed. As soon, however, as the summer days grow warm and flies begin to be annoying, the animals are allowed to graze from 4 o'clock in the afternoon on through the whole night up to 8 o'clock in the morning, remaining during the daytime in the cool stalls. While there they are provided with as much corn-straw as they like—and this, during wet weather, they seem to prefer; no other fodder is given them in the stalls. The two grazing-grounds are ordinarily used alternately for four weeks at a time, so that the herbage gains strength before the cattle graze upon it. As soon as one inclosure has remained for some time idle the dung is carefully broken up and the weeds are mown off. Besides the dung of the grazing animals the grounds are only manured every few years with wood ashes. From the age of about six months up to the age of pregnancy, which is here about two and a half years, only the female cattle graze during summer, whilst the young males are cared for the same as at Hohenheim. A very strong bodily development and excellent health are found by an experience of thirty years to be the results of the above-described system of rearing by grazing.

This is the only feature distinguishing cattle-breeding here from that at Hohenheim, and I think that it would scarcely be worth while to come here personally, especially as at present the grazing is over with for this year.

With highest regards,

Oeconomierath SCHOFFER,
President of the K. Ackerbauschule.

CATTLE-BREEDING AT RAVENSBURG.

From Ravensburg, situated in the Swabian uplands near Lake Constance, in the southeasterly part of the Kingdom, it is reported in the last chamber of commerce report, as follows:

The new law about bulls will, without doubt, contribute very much to the improvement of cattle-breeding, although the poorness of the soil in Oberschwaben causes some difficulty and renders the keeping of township bulls almost impossible. It is to be hoped that through a better choice of bulls the brown cattle will be reserved to the Oberland, and will be able to resist successfully the encroachments of the particular race as far as dairy uses are concerned. Where breeding prevails, the quicker growing parti-colored cattle are in their right place, and should be bred pure, whilst the aimless system of crossings between brown and red cattle, now prevailing in many places, should be opposed by every possible means. A further incentive to a better breeding and rearing of cows will be the higher price for the milk, obtained in many households and dairies in Oberschwaben through the introduction of the cold-water method, which we are glad to state is coming more and more into vogue. Only lately the dairy at Sigmarshofen was remodeled according to this system. The "Molkerei Genossenschaft" (dairy association) at Aichstetten also makes a very good showing in its last year's business.

From the Kingdom, improved general intelligence referred to (dairy association) producing 150 to 160 p and also some From Rottw tory, and th directed to a lively sale besold to m

In the district market in 18 Ellwangen, Gmund, 6,8

Cattle.	.
Ox.....	Crai Ellw Glen Gm Crai Ellw Glen Gm Crai Ellw Glen Gm
Bull.....	Crai Ellw Glen Gm Crai Ellw Glen Gm
Cow.....	Crai Ellw Glen Gm Crai Ellw Glen Gm
Heifer.....	Crai Ellw Glen Gm Crai Ellw Glen Gm
Yearling...	Crai Ellw Glen Gm

In Heilbronn the 14th of November one hundred

The chamber of commerce of the Swabian uplands has been sent from the hoof only and bringing

CATTLE-BREEDING AT HEIDENHEIM.

From the district of Heidenheim, in the northeasterly part of the Kingdom, it is reported that the stock of cattle has both increased and improved during a series of years abundant in food, through a more general introduction of the Simmenthal blooded stock. In the district referred to there was founded in 1882 "die Molkerei Genossenschaft" (dairy association) at Gerstetten, numbering fifty-seven members, and producing daily from 1,100 liters of milk, 65 to 80 pounds of butter, and 150 to 160 pounds of cheese. The butter is sold to Ulm, Stuttgart, &c., and also somewhat to North Germany, the cheese principally to Ulm. From Rottweil it is reported that the condition of the cattle is satisfactory, and that in just recognition of its importance greater attention is directed to it from year to year. The race bred in the district has found a lively sale at good prices; unhappily many a fine young animal must be sold to meet the deficit caused by the bad prices of corn.

In the district of Heidenheim the total number of cattle brought to market in 1882 was, to the 12 fairs in Crailsheim, 3,793 head; the 12 in Ellwangen, 15,005 head; the 10 in Giengen, 5,701 head; the 13 in Gmund, 6,877 head.

Prices of Heidenheim cattle.

Cattle.	Markets.	Highest average price.		Lowest average price.	
		Month.	Price.	Month.	Price.
			<i>Marks.</i>		<i>Marks.</i>
Ox.....	Crailsheim	November	444.50	April	317.00
	Ellwangen	do.....	410.00	December	380.00
	Giengen	August and September ..	385.00	April	245.00
	Gmund	August	423.50	January	321.00
Bull	Crailsheim	do.....	243.50	October	175.00
	Ellwangen	March	315.00	July	285.00
	Giengen	September	213.00	April	180.00
	Gmund	do.....	262.50	February	235.00
Cow	Crailsheim	December	230.00	November	165.00
	Ellwangen	November	200.00	May	200.00
	Giengen	December	240.50	January	161.00
	Gmund	February	225.00	April	190.00
Heifer	Crailsheim	July	168.00	February	53.50
	Ellwangen	May and November	225.00	do.....	205.00
	Giengen	September	225.00	January	150.00
	Gmund	June	120.00	December	75.00
Yearling...	Crailsheim* .....	.....	.....	.....	.....
	Ellwangen .....	.....	.....	.....	.....
	Giengen	December	112.20	January	135.00
	Gmund	September and October ..	202.50	April	130.00

*Here the yearlings are not separated from the heifers.

AT HEILBRONN ON THE NECKAR.

In Heilbronn a district cattle exhibition took place from the 12th to the 14th of May, to which one hundred and twenty-nine exhibitors sent one hundred and seventy-one cattle, all more or less worthy of notice.

CATTLE TRANSPORT VIA THE ST. GOTHARD.

The chamber of commerce at Heilbronn reports that since the opening of the St. Gothard tunnel 100 to 300 oxen of the best quality have been sent from Italy to South Germany, costing per 100 pounds on the hoof only 20 to 30 marks (\$5 to \$7.50) in Milan and Alessandria, and bringing 38 to 42 marks (\$9.50 to \$10.50) in Mannheim and Frank-

fort. It is reported that the freight for these oxen, inclusive of 20 marks (\$5) duty, amounts, from Milan to Mannheim, to 70 marks; consequently about 5 marks per hundred weight on the hoof, and the dealer, therefore, without calculating losses through accident, makes a gain of 3.5 marks per hundred weight, at which high rate of profit it seems probable that the dealer may have paid a portion of the duty.

But this new competition will not prove permanently dangerous, as the quality of the meat of the Italian ox does not come up to that of the ox raised in Wurtemberg, and does not keep so well. The low prices in Italy are ascribed to the fact that Austrian cattle are prohibited in Germany, and the fattened cattle from Austria, instead of going directly thither as formerly, are now said to pass first through Italy. On the other hand another very important element is to be noted in regard to our cattle trade, viz, the supplying of beef to the Parisian market from France exclusively, as has been the case for some time past.

CATTLE TRADE AT CALW.

From Calw it is reported: "The prices of cattle are everywhere good, and constitute, with hops, the principal source of income of the farmer. In consequence of the use of spoiled provender the hoof disease seems to have quite generally attacked the cattle. Although it is easily treated, it has yet caused great disturbance in the cattle trade. This trade has been a lively one during the entire year past, fat and fleshy cattle being always in demand and fat oxen, which form a principal article of export from the southwestern part of the Black Forest, being sold direct at the fairs and out of their stalls by the peasants to butchers and wholesale dealers. Milch cows and cows about to calve were also in demand and brought good prices.

CATTLE-FAIRS IN 1882.

To five cattle-fairs in Heilbronn were brought 92 bulls for breeding, 1,162 fattened oxen, 1,744 draft oxen, 2,212 bulls, 2,254 milch cows, 1,327 head of young cattle, 3,900 pigs, 126 horses. In Hall were brought to market 4,387 oxen, 3,026 cows, 3,269 head small cattle; whereof were sold 2,812 oxen, 1,663 cows, 1,860 head small cattle, with a total product of 1,756,393 marks. To the three cattle-fairs in Kunzelsau were brought 1,209, sold 400 head, with a product of 81,461 marks; average price per hundred weight on hoof: Fattened cattle, 36 marks; draft-cattle, 21 marks; young cattle, 18 marks. To the cattle-fair in Ebingen, 1,156 head were brought. At seven cattle-fairs in Calw were sold about 500 head of cattle, 300 to 400 horses, and about 1,500 pigs. In Nagold were sold 482 oxen, 853 cows and small cattle, 1,889 pigs, with a total produce of 339,307 marks. In Rottweil were brought to ten fairs, 796 horses, 2,805 oxen, 2,365 cows, 2,298 yearlings, 544 bulls, 160 goats, whereof there were sold on an average two-thirds.

CLIMATE OF WURTEMBERG.

The Kingdom of Wurtemberg lies at a varying elevation of from 135 to 1,151 meters (on the average 500 meters) above the level of the sea, and extends from 25° 32' 20" to 28° 9' 36" east longitude, and from 47° 35' to 49° 33' 30" north latitude.

The mean temperature for the last ten years averaged + 6.7° Réaumur the year round; in spring, + 6.4°; summer, + 13.9°; autumn, + 6.9°, and in winter, - 0.2° R.

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Yearlings ...
Swine
Calves
Sheep

Total ...

In regard to agriculture the climate ranges from "summer-corn" to "middling wine" climate, the "winter-corn" climate predominating.

Spring begins in the latter part of March and lasts till the end of May, followed by three warm summer months. September and October are usually very sunny autumn months, while November forms the transition to winter, which in general is not severe or very snowy, on the contrary, often too mild and rainy. On the whole Wurtemberg, like all Western Europe, has milder winters and warmer summers than are to be expected according to its mean geographical latitude.

SOIL OF WURTEMBERG.

According to its geology and the character of its soil, which is intimately connected therewith, the country may be divided into the six following groups:

	Hectares
Group 1. Colored sandstone.....	142,370
Group 2. Shell lime.....	561,514
Group 3. Red marls.....	261,614
Group 4. Black and brown jura.....	296,214
Group 5. White jura.....	327,284
Group 6. Tertiary sandstone.....	404,383

Area of the whole country..... 1,950,379

DISTRIBUTION OF AREA.

The entire area of the Kingdom is subdivided as follows:

Description.	Hectares.	Per cent.
Buildings, courts, streets, and roads.....	50,692	2.6
Cultivated lands.....	828,385	42.5
Meadows.....	277,880	14.2
Gardens and fields.....	88,295	4.5
Vineyards.....	26,135	1.3
Pasture land.....	84,130	4.3
Woodland.....	604,918	31.0
Streams, lakes, &c.....	12,681	0.7
Barrens, quarries, marl pits, and sand pits.....	27,298	1.4
Total.....	1,950,379	100.0

MEAT SUPPLY OF WURTEMBERG.

The veterinary surgeon of Stuttgart reports that during the year 1882 there were slaughtered in the city limits the following number of animals, viz:

Description.	Number.	Total weight.	Average weight.
		<i>Pounds.</i>	<i>Pounds.</i>
Oxen.....	5,611	3,340,184	595
Bulls.....	524	327,419	624
Cows.....	750	299,500	399
Yearlings.....	7,093	2,305,124	324
Swine.....	24,807	3,512,481	141
Calves.....	40,680		
Sheep.....	2,259		
Total.....	81,724		

No corresponding figures covering the entire Kingdom are obtainable, though an approximate estimate may be gained from the statement that Stuttgart's population is about one-seventeenth of that of all Wurtemberg. As above stated by Professor Dr. Vossler, of Hohenheim, much beef is exported, principally to France, to other parts of Germany, and to Switzerland. I learn further that some considerable quantities are sent as far as Belgium, and even across the channel to England.

MEAT PRICES AT STUTTGART.

I append herewith a statement showing the current prices at which the various kinds of meat are sold in the Stuttgart markets (week ending November 25), viz :

Description.	Quality.	Price per 100 pounds—		Retail price per kilogram (2 pounds).
		On the hoof.	Slaughtered.	
Beef		<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>
Do	1	30 to 40	50 to 80	1.30 to 1.48
Pork	2	20 to 36	40 to 72	1.16 to 1.48
Do	1	46	61	1.40
Veal	2	42	60	1.38
Do	1	42	64	1.20
Mutton	2	38	62	1.16
Do	1	30	60	1.20
Do	2	20	40	.80

ASSOCIATION DAIRIES IN WURTEMBERG.

Agriculture is carried on in Wurtemberg chiefly by small farmers, and consequently, in the individual branches of agricultural production, the technical and economical advantages pertaining to farming, when carried on on a large scale, can only be enjoyed by the greater part of Wurtemberg agriculturists by means of association. For this reason efforts have been made for some years past to establish regularly organized associations among the rural population, with joint and separate guarantees to the members, and for the purpose of producing butter and cheese from milk. Up to the present time two such associations have been founded in Wurtemberg, concerning the origin, institution, and methods of which the following remarks furnish some explanation in connection with the accompanying regulations:

THE DAIRY ASSOCIATION AT AICHSTETTEN.

The borough of Aichstetten is situated on the southeastern frontier of Wurtemberg, in the county of Leutkirch (belonging to the Donaukreis), and distant only about 3 kilometers from the Bavarian frontier, on the little river Aitrach, and on the high road once much frequented from Leutkirch to Memmingen, in the Wurtemberg Allgau.

The altitude of the place being 600 meters and the Alps being near at hand, the climate is rather harsh, damp, foggy, and windy, and is especially marked by sudden changes of temperature, with frequent hoar and spring frosts and late springs. The conditions of the soil are, on the whole, favorable; but, as the climate is less so to the cultivation of commercial products and fruits, circumstances naturally suggest to the farmer chiefly the raising of provender for cattle and the cultivation of corn, and the deriving of the principal part of his revenue from the keeping of cattle.

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Aichstetten,

Aichstetten numbered, on the 1st of December, 1880, 826 inhabitants. Its area comprises 1,441 hectares, of which 800 are arable land, 260 meadow, 21 pasture, and 360 wood.

The live stock amounted, according to the census of 1873, to 117 horses, 1,019 head cattle, and 120 swine. Sheep are not kept.

The classification of property of those citizens, numbering about 100, who chiefly occupy themselves with agriculture, is at present as follows: Farmers who own above 20 hectares are counted among the large proprietors; farmers with 10 to 20 hectares among the middling, and those under 10 hectares among the small ones. According to this division there are at present at Aichstetten twenty large, forty middling, and forty small proprietors. There are no large estates, properly so called; according to the rating generally prevailing, and especially in North Germany, concerning landed estates, the large proprietors would count among the middling, so that, according to this scale, only middling and small farmers are to be found at Aichstetten.

THE ASSOCIATION DAIRY AT ALLGAU.

Dairies have been established in the Allgau for a long time past, and there is considerable cheese manufactured, not ordinarily, however, by the farmers themselves, but by "cheesers" (Käser), to whom the farmers furnish the milk at a fixed price (for some years past at 8 to 9 pfennigs per liter), whilst the waste of buttermilk and whey is returned to the furnishers of the milk. Under these conditions, the sale of the milk has become more and more a matter of monopoly for the "Käser;" they fix the price of the milk, and the farmers have been able to do nothing against this one-sided arrangement, as the individual farms are mostly too small to enable their owners to manufacture their own cheese profitably, and, moreover, as, owing to the lack of larger towns in the vicinity, a direct sale of the milk is impossible. Besides, dairy management had not kept pace with recent improvements, and the preparation of butter had in many cases continued defective. A thorough improvement of these conditions could only be looked for by the formation of associations among the farmers, who would jointly and practically look after the making of butter and cheese. At the same time it was to be expected that the introduction of the principle of association into agriculture would exercise a favorable effect also on its other branches.

In order to attain the desired aim, it was first of all necessary to bring the new method of dairy management to the notice of the farmers in the Württembergish Allgau. An agricultural exhibition held at Leutkirch in the autumn of 1879, by the twelfth agricultural district association, offered the wished-for occasion. With it was connected a dairy exhibit, in which, at the expense of the royal centralstelle for agriculture, the making of butter and cheese after the latest methods (together with the separator arrangement) was for a few days practically illustrated. This special exhibit aroused the highest interest among the great number of country people who attended. On the 28th of September, eight resident farmers, owning 152 cows in all, resolved upon the founding of an association for the common handling and sale of the milk, and charged a committee with the preliminaries for the establishment of a dairy building of their own. But various obstacles caused delay, and it was not until the 29th of January, 1880, that the association was definitely organized as "The Württembergische Molkerei Aichstetten, eingetragene Genossenschaft" (registered association).

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The principal obstacle vanished when a copious supply of fresh spring-water was found at an easy depth and attaining even in the hottest summer weather a temperature of not over 10° Celsius. This valuable discovery necessitated the construction of a pump work; but as heating by steam also recommended itself as cheaper, cleaner, and more easily regulated, it was decided to purchase a boiler of six atmospheres and a motor of 4-horse power. The latter pumps water and works the churn, while the steam heats the cheese-vat and warms the entire building. In the cellars especially has the moist, equalized warmth engendered by steam-heating proved unusually favorable to the ripening of the cheese.

Upon entering the dairy building, which is built in a pleasing style on a small hill in the center of the village, and forms one of its ornaments, we first come to the vestibule, which serves at the same time for the reception of the milk. According to the regulations milk must be delivered unstrained, as in this state the presence of foreign substances and of impurities can be much more easily detected. It is twice strained, then weighed, and the quantity delivered by each furnisher is credited in his milk-book and also in the register of the association. In the vestibule are also a number of test-glasses, used in determining the percentage of cream which the milk of each furnisher contains.

At the left of the lobby we enter "das Aufrahmungslokal," a high and well ventilated hall, provided with long cement troughs sunk in the floor. In these the milk vessels, containing 40 liters each, are placed on lath-racks; the capacity of cooling-troughs is 2,300 liters. The water for feeding them is pumped into cast-iron reservoirs, which are under the roof.

During the first one and one-half to two hours the water is allowed to flow in and run off with full force, after which no further flow is necessary. According to the method of Swarz the principal process of extracting the cream takes place after two hours and is finished in twenty-four hours; any farther extraction of the cream is avoided, as otherwise the cheese loses in weight and becomes thin.

The cream, which is taken off after twenty-four hours, remains for another twelve hours in cold water, so that it is put into the churn with a temperature of 10° Celsius. The churn used is an improved Lohfeldt "Rollbutterfass," from the "Centralmolkereimagazin" of F. H. Schmidt, at Munchen. It contains 250 liters of cream and can turn out 50 pounds of butter at a time. The churning process requires forty-five minutes; the butter is taken out of the churn at 12° Celsius, is left for an hour in fresh water, and then put under the kneading machine. The kneaded butter is then made into rolls of 1 pound each, which are marked with the stamp of the association, packed in wet parchment paper, and then again placed for an hour in quite cold water, after which they are shipped away by post in boxes of 4½ kilograms each. The Aichstetten butter has grown greatly in favor on account of its fine taste and of its keeping well. The daily shipment amounts to 75 kilograms, and the demand cannot be supplied. A yield of 3¼ to 3½ kilograms of butter from 100 kilograms of milk is about the highest result obtained.

At the right of the lobby there is the "Käserlokal," where stands a cheese-vat with a capacity of 1,000 liters. It is of wood, copper-bottomed, and warmed by steam from below. In manufacturing "Backstein cheese" the skimmed milk warmed to 33° Celsius is curdled with liquid rennet. The Aichstetten "Backstein" cheese is distinguished, besides its good appearance, by its excellent taste, and, in spite of its being less rich, always brings the highest prices paid for this sort of cheese.

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Besides "Backstein" cheese round cheese (Rundkäse) is manufactured. Also here the milk is curdled at 33° Celsius and worked to 40° Celsius.

Round cheese is sold at present at 80 pfennigs; "Backstein" cheese at 60 pfennigs, and butter at 2.20 to 2.40 marks per kilogram, while peasants' butter sells only at 1.60 marks. The yield of cheese amounts from 9 to 10 kilograms of Backstein, and a little less round cheese, from every 100 kilograms of milk.

The whey is given to the milk furnishers, who take back on every 3 kilograms of furnished milk 2 kilograms of whey, and on every 10 kilograms of milk 1 kilogram of buttermilk, which remains perfectly sweet.

From the "Käsereilokal," in which, besides the cheese-vat, are placed the butter kneader, the stretching table, and the press, we come to the machine hall, where, in addition to the horizontal steam engine, the pump and the churn are placed. In a separate room stands the boiler, which is heated with Ruhr lump coals. The daily consumption of coal is 2 centners, which, at Aichstetten, costs 1½ marks per centner. The entire space underneath is occupied by the cheese cellars, which are high and well ventilated and fulfill all the necessary conditions for the proper ripening of the cheese.

The whole establishment, with its carefully-scoured cement floors, and the cleanliness prevailing everywhere, gives a very favorable impression, as compared with the old, smoke-blackened, cheese-kitchens of the Allgau district.

Under the roof are apartments for the cheese-maker and the apprentices, and room for storing wood, &c.

The dairy was opened on the 5th of July, 1880. The entire plant cost 25,628 marks, the chief items of which are the building, 11,710 marks; the steam-engine, the boiler, and the fountain, 7,255 marks; the interior fittings, 4,539 marks; the ice cellar, 707 marks, and sundries, 1,364 marks. To cover these outlays a loan was raised under the joint and individual guarantee of all the members of the association. According to section 12 of the statutes, on every kilogram of milk furnished to the dairy 1 pfennig is due to the treasury of the association. One-half of the money thus raised is applied to payment of interest and the canceling of the loan, while the other half goes to defraying current expenses and to the accumulation of a reserve fund. On every kilogram of furnished milk members receive on account 9 pfennigs; whatever beyond that is obtained by the management is paid to them yearly as their share of the profit, after the deduction of all charges. The quantity of milk daily used averages 1,500 kilograms. The price per kilogram amounts to 12½ pfennigs, without the whey. Every kilogram is taxed 1.3 pfennigs for the expenses of the association.

This new enterprise, to which His Majesty the King, upon the suggestion of the ministry of the interior, has granted a considerable subsidy from the fund of the royal centralstelle for agriculture, shows, after almost two years of existence, a steady, thrifty progress. As the best proof of the recognition it finds among the people it may be stated that the membership of the association has increased from eight to thirty, owning in all two hundred and eighty-five cows. The association exercises, both directly or indirectly, a salutary influence upon the revenue of its members, who thus obtain an assured and more profitable sale of their milk, while the growing of provender and breeding of cattle are improved. But not less important is the favorable influence which such an association may exercise in a moral point of view on its members as well

as on the whole community through the fact that working and caring for a common enterprise draws men nearer to one another and teaches them the better to agree together. The system and cleanliness indispensable in the dairy business find their way by and by into the stalls of the cattle and the dwellings of the families, bringing with them all their blessed sanitary benefits.

THE DAIRY ASSOCIATION AT HELDENFINGEN.

Sooner than might have been expected the example of Aichstetten has been followed and a second Wurtemberg Dairy Association has been organized at Heldenfingen.

The village of Heldenfingen is situated near the eastern frontier of Wurtemberg, in the county of Heidenheim, belonging to the Jagst district, on the elevated plateau of the Swabian Alps, about 650 meters above the sea. Its climate is severe, belonging to the zone of winter-corn, windy, rather dry, less favorable in general to the growth of commercial products and fruits. The soil is a strong, calcareous, clayey one, the product of the disintegration of the white Jura, partly flat, stony, and frequently too dry, as the surface water is quickly absorbed.

Heldenfingen has 836 inhabitants, owning in all an area of 950 hectares, used for agricultural purposes; there are 880 hectares arable land, 30 hectares meadows, and 40 hectares pasture land.

The stock of cattle amounted on the 1st of April, 1881, to 55 horses, 531 head of cattle, and 80 swine.

The distribution of the property in areas is as follows: The greatest proprietor has 60 hectares; seven great proprietors have each 30 to 50 hectares; twenty middling proprietors have each 10 to 30 hectares, and one hundred and fifty-seven small proprietors have each under 10 hectares.

This shows that small proprietors are in a large majority in Heldenfingen, and that real estate is here still more divided up than it is in Aichstetten. Under these circumstances greater results in point of economy can only be obtained through the association plan.

In Heldenfingen, as in the whole Wurtembergish Alps region, the cultivation of corn has occupied hitherto by far the greater area and constituted the principal source of income of the farmer. Although the stock of cattle has been considerably improved in the last decades by the increased growth of clover, which is especially important on account of the small area of meadow land, yet the farmer could not reap the full benefit of it, as the direct sale of milk was impossible, owing to the distance from larger towns and the railroad, and dairy management was unknown or confined to the preparation of an inferior quality of butter, which had to be sold at correspondingly low prices (1.50 marks per kilogram).

Whilst Aichstetten is situated in a locality where dairy management has been in vogue for a long time and forms the most important branch of agricultural industry, so that the question there consisted merely in an essential improvement of an already existing branch of trade, the improved dairy system as introduced in Heldenfingen was for that place quite a new branch and one hitherto unknown there.

The first impulse to it was given in Heldenfingen in the autumn of 1881 through a lecture delivered by the itinerant instructor in agriculture for the Jagst district concerning the recent progress made in dairy matters and the higher yield of milk consequently to be obtained through the association plan.

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*See report

In the lecture it was also pointed out that one of the most important conditions for the successful management of a dairy, viz, pure, fresh water, now existed through the parish of Heldenfingen having but a short time before joined the rough Alps water-works system, thereby receiving good spring water in abundance from the pumping station in the Eyb Valley, near Geislingen, 29 kilometers distant.

On the 5th of December, 1880, thirty farmers resolved upon founding an association for the common handling and sale of milk, and charged a committee of five members with the work necessary for the carrying out of the resolution.

The members of the committee, under the guidance of the president of the association, Schultheiss Bosch, visited the dairy at Aichstetten, and from the favorable impression thus derived soon agreed to establish a similar institution in Heldenfingen, and in so doing to profit by the experiences gained at Aichstetten.

But as there, so also at Heldenfingen, the final realization of the enterprise encountered various difficulties. Doubt as to the usefulness and profitableness of the business took more and more hold upon not only the adversaries, but also upon those who had hitherto been friends of the project, and the president of the association very properly reported to the Royal Centralstelle for agriculture in regard to the discord among the members of the association that "a regular April shower had occurred, followed by heavy spring storms."

But when the members' disposition had finally grown more favorable it was found possible to commence building in June, 1880, and the dairy was opened on the 10th of October, 1881.

The dairy building is neat in style, and is constructed like that at Aichstetten, according to the newest plans, but is more spacious in dimensions. It has the necessary facilities for the Swarz skimming method, for the working of the cheesery by steam, and for the steam heating of all the rooms. The total cost for building and construction amounts to 24,000 marks, viz:

	Marks.
For the building of the house, inclusive of the purchase of the building lot..	14,000
For boiler, 5 steam stoves, steam and water pipes, dairy constructions.....	6,000
For the ice cellar, water reservoir for cooling water with ice, construction of an elevator in the cheese cellar, fencing in of the ground, &c.	4,000

To meet these expenses a loan was raised under the joint and individual guarantee of all the members, the interest on which is paid, and the cancellation of which takes place according to the statutes hereafter printed, on the same safe basis as at Aichstetten, 1 pfennig on every kilogram of milk furnished being first withheld for the treasury of the association.

A water pump was not required in this dairy, as the water from the pipes of the rough Alps water-works rises by its own pressure as high as the upper rooms of the building. The water has in winter a temperature of 6° Celsius, in summer of 10° Celsius, and must therefore in the latter season, through the use of ice, be cooled to its winter temperature.

The new dairy at Heldenfingen may be considered a gratifying result of the establishment of the Alps water-works, built by the aid of the Government, for otherwise the former lack of water in that region would have rendered the idea of founding a larger dairy impossible.*

As at Aichstetten, the making of fine table butter and of good Backstein cheese is the aim of the management.

*See report on water-works in rough Alps, Consular Reports, No. 10, p. 268.

The thirty members, among whom there are seven large, twelve middle, and eleven small proprietors, own in all one hundred and twenty milch cows, consequently only four cows on an average to each, while at Aichstetten there is an average of twelve cows to each. Some larger partners furnish the dairy 65 to 70 kilograms of milk daily, the smallest only 6 kilograms, showing that the new enterprise offers even to the smallest producer an opportunity of profitably selling his milk, an opportunity which he formerly lacked entirely.

At first 650 kilograms of milk were handled daily, from which about 21 kilograms of butter and 50 kilograms of Backstein cheese were obtained; but arrangements have been made looking to the handling of 1,300 kilograms of milk daily. The butter and cheese are of an excellent quality, and the former finds a ready sale at 2.20 marks (whilst ordinary peasants' butter brings only 1.50 marks), the latter at 60 to 70 pfennigs per kilogram. The butter, like that from Aichstetten, is shipped principally to Berlin, Leipsig, Stuttgart, and other large towns. Members receive for every kilogram of furnished milk 8 pfennigs; what is obtained beyond that is, after the deduction of all expenses, yearly divided in shares of profit.

To this enterprise also His Majesty the King has, upon the suggestion of the ministry of the interior, granted a considerable subsidy from the funds of the Centralstelle for agriculture.

Whoever enters the dairy premises and notes the cleanliness and systematic detail everywhere prevailing gains an extremely favorable impression of the new enterprise. One can well understand why the people of Heldenfingen speak with some pride of their dairy, which in the whole neighborhood and even beyond wins a name for the quiet Alpine village and promises to become a source of material welfare for its inhabitants.

CONCLUSION.

The latitude given by the circular of instruction calling for this report has enabled me to cover a wide range of subjects, and to go into details and statistics which I trust will prove of value to American stock-breeders and those engaged in kindred pursuits. As has been already stated, Wurtemberg is the leading German state in these branches of agriculture, and the subject therefore derives an increased importance for this consular district. As appendices to my report will be found:

Translation of a decree (June 16, 1882), from the ministry of the interior providing for the carrying out of the law in regard to bull-keeping.

Translation of the statutes of the Dairy Association, (registered company at Heldenfingen.)

Table showing cost, expenses, and outlays of bull-keeping at Kirchheim, under Teck.

Table showing the percentage of area in each geological group, and in the entire Kingdom of Wurtemberg subdivided as regards cultivation.

Table showing the percentage of each of the various kinds of products raised upon the arable surface of each group, and of the entire Kingdom.

The characteristics, productiveness, &c., of the Simmenthaler and Allgauer breeds of cattle, and their respective crossings.

I also forward as inclosures, &c., accompanying this report, and illustrative of it, the following:

Six models (in *papier maché*) of breeds of cows mentioned in the report, viz:

(1) Simmenthaler; (2) Allgauer; (3) Sühwiesbisch Hailer; (4) Limburger; (5) Alb; (6) Neckar.

* Published in the supplement.

† Published in body of report, as inserted by the consul.

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Table showing

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Marketable p
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buge, &c.
Beans, peas,
Fallow groun

Total.

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Consul.

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Description.	Group I.—32,355 hectares.		Group II.—272,813 hectares.		Group III.—78,777 hectares.		Group IV.—121,165 hectares.		Group V.—153,048 hectares.		Group VI.—170,227 hectares.		Entire Kingdom— 823,383 hectares.
	<i>Per</i> <i>ct.</i>	<i>Per</i> <i>ct.</i>	<i>Per</i> <i>ct.</i>	<i>Per</i> <i>ct.</i>	<i>Per</i> <i>ct.</i>	<i>Per</i> <i>ct.</i>	<i>Per</i> <i>ct.</i>	<i>Per</i> <i>ct.</i>	<i>Per</i> <i>ct.</i>	<i>Per</i> <i>ct.</i>			
Winter-spelt	15.46	21.98	22.85	28.63	38.42	25.00	23.64	28.63	38.42	25.00	23.64		
Oats	17.98	12.49	13.72	16.15	18.54	14.44	14.00	16.15	18.54	14.44	14.00		
Barley	2.73	11.23	8.98	10.11	9.44	18.42	10.76	10.11	9.44	18.42	10.76		
Other winter and summer corn	12.21	11.90	14.32	8.89	8.36	9.17	10.43	11.90	11.90	9.17	10.43		
Clover, lucern, &c.	9.45	10.62	9.88	9.09	10.76	12.00	10.60	10.62	9.88	10.76	12.00		
Potatoes	11.90	8.63	11.29	9.99	5.36	5.58	7.88	11.29	9.99	5.36	5.58		
Marketable products, hops, tobacco, &c.	3.22	4.52	3.86	3.78	12.03	3.73		4.52	4.52	3.86	3.78		
Essentials, red beets, sweet turnips, cabbage, &c.	3.46	4.79	3.89	3.80	2.16	2.73	3.49	4.79	4.79	3.89	3.80		
Beans, peas, and green corn	2.07	3.87	3.08	2.52	2.28	2.58	2.90	3.87	3.87	3.08	3.08		
Fallow ground	21.58	0.97	8.93	9.53	17.35	10.59	11.67	0.97	8.93	9.53	17.35		
Total.	100.00	100.00	100.00	100.00	100.00	100.00	100.00						

CHARACTERISTICS OF WURTEMBERG CATTLE.

The characteristics, productiveness, &c., of the Simmenthaler and Allgauer breeds of cattle and their respective crossings are as follows:

Simmenthaler and crossings.—Their color is red and yellowish brown; brown and white speckled, and wheat-bread colored. The head is strong and broad; neck short and broad; horns often rather heavy; back straight; caudal bone often high; belly deep and well rounded; chest wide; legs well formed and strong. Bred pure in Hohenheim since 1835. Origin, Canton Bern, Switzerland. This breed arrive at maturity at three years of age, when the weight of meat is from 48 to 60 per cent. of live weight. They are excellent for draft purposes and capable of doing a large amount of work. The meat is rather coarse fibered, but good. The size of the cow at maturity is as follows: Height, 1.45 meters; length, 2.24 meters; haunches, .66 meter. The bull: Height, 1.50 meters; length, 2.30 meters; haunches, .68 meter. The ox varies greatly. The weight of the cow is from 350 to 700 kilograms; bull, from 500 to 1,000 kilograms; ox, 500 to 1,000 kilograms. The annual average product of milk is from 2,000 to 2,500 kilograms, of excellent quality, 25 to 30 kilograms producing 1 pound of butter. Cheese of excellent quality is made; 11 kilograms of milk producing 1 kilogram of cheese.

Allgauer and crossings.—Brown, grayish brown, with light streaks around the mouth and over the back. Fine bone; the body small, but well shaped; head short and broad; horns, light; back straight; legs well formed. Originally from the western part of the Tyrol. Mature at three years of age, when the weight of meat is from 50 to 60 per cent. of live weight. Good powers of endurance. The meat is finer than the Simmenthaler. Their size is as follows: Cow, 1.24 meters high; 1.94 meters long, and haunches, .54 meter; bull, 1.40 meters high; 2 meters long, and haunches, .60 meter; ox, varying greatly. Weight: cow, 300 to 500 kilograms; bull, 400 to 700 kilograms; ox, 400 to 600 kilograms. The annual average production of milk is from 2,100 to 2,400 kilograms; 20 to 22 kilograms producing 1 kilogram of butter; 9 kilograms of milk producing 1 kilogram of cheese. The milk and cheese are of very good quality.

CATTLE BREEDS OF BADEN.

REPORT BY CONSUL BALLOW, OF KEHL.

The three best varieties of cattle existing in the Grand Duchy of Baden are the Messkirch cattle, the Baar cattle, and the Black Forest cattle.

MESSKIRCH CATTLE.

The finest breed of Baden is the Messkirch cattle.

The district of Messkirch belongs to that hilly part of Southern Baden which extends from the Lake of Constance to the Swabian Alp. The chief town of this district is Messkirch, with 2,000 inhabitants. The Swabian Alp, with parts of the Black Forest, forms a plateau which is called the Heuberg. This chain of hills has an altitude of about 2,000 feet above the level of the sea. The soil consists, principally, of gray and yellowish limestone. There is a great scarcity of water, on account of the many crevasses in the ground, which absorb the rains and prevent the formation of sources. The climate is that of an unsheltered highland. The height of the barometer is 26.3 Paris inches. The average temperature during the year is $+6.35^{\circ}$ Celsius; the warmest month is July, with an average temperature of $+15.26^{\circ}$ Celsius; the coldest month is January, with -2.67° C. From the foregoing it will be seen that the climate is quite severe, but, notwithstanding, it is advantageous for cattle-breeding. This circumstance is attributed to the calciferous nature of the ground. The original cattle of

the Messkirch cattle are short but productive in milk. In 1830, however, the cantons of this district were followed by a year after the variety of fleshiness, and the duration of the lactation in the cantons of Switzerland did not improve the climate. In 1880, and 7 years after, which physicians and animals are that one bull of the bulls in the district.

Among the first-class (v.) Second-class (p.) Third-class (p.) Fourth-class (p.)

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The Messkirch cattle are:

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the Messkirch district were small, of a fine structure, red in color, short but pointed head, and strong, short horns. They were very productive in milk, and frugal regarding their fodder. Toward the year 1830, however, the stock-breeders began to import bulls from the Swiss cantons of Zurich and Schwytz, and soon a great change was observed. This was first done in Messkirch, but the example was immediately followed by all stock-breeders in the whole district, so that twenty-five years afterward the Swabian Alp cattle had very nearly disappeared. The variety obtained by this interbreeding is distinguished by its great fleshiness, abundance in milk on the one hand, and strength and endurance for labor on the other. The importation of cows from Switzerland did not have good results; they did not become used to the climate. The number of cows in the Messkirch district was 5,000 in 1880, and 76 bulls. These bulls are the property of the community, which pays for feeding and attendance. Even the stables where these animals are kept belong to the community. The Government prescribes that one bull must be kept for every eighty cows. The inspection of the bulls in 1882 in the Messkirch district gave the following result:

Among seventy-six bulls there were—

First-class (very good).....	35
Second-class (good).....	30
Third-class (proper for breeding, but of ugly shape).....	19
Fourth-class (unfit for breeding, with defective constitution).....	1

As a rule cows are covered for the first time at the age of one and a half years, and calve generally at two and a quarter years. Cows which calve before they have reached their full growth never become very strong nor productive in milk. The inclosed photographs, for which I am indebted to the courtesy of his excellency the state minister of the Grand Duchy of Baden, are all of the Messkirch breed and show to good advantage their build &c.; they were purposely obtained for this report, and are good average specimens of these cattle.

PECULIARITIES OF THE MESSKIRCH CATTLE.

The Messkirch cattle are nearly all checkered; the different kinds are:

(1) Yellow checkered, light yellow or dark yellow on the back with irregular, clearly defined white spots.

(2) Red checkered, hair on the back red, mostly red or yellowish, sometimes dark red with dim white spots.

(3) White checkered, white back, flanks red hair, head and feet white. Besides these there are animals which are either all red or all yellow, the head is white, some have little yellow or red spots around the eyes. Statistical comparisons made in 1873 show that the yellow and red checkered color is most prevalent in the Messkirch district.

The nostrils, the same as the membranes of the mouth-cavity, are without color; the horns and hoofs are yellow, resembling wax. The tuft of hair over the ears is of the same color as the hair on the back. The end of the tail is mostly white. Black or brown spots on the nostrils are marks of the descent from the original Swabian Alp cattle.

Red or yellow checkered animals with white head, yellow horns and hoofs, colorless nostrils, and white end of tail are most frequent in the Messkirch district.

SIZE AND WEIGHT.

Size and weight of all breeds of cattle vary considerably; the Messkirch breed are no exception to this rule. Animals which get good and abundant food will be much heavier in weight than those whose food is insufficient. The following table will show the average sizes obtained by actual measurement:

Kind.	Number of animals.	Average height.	Average length.
Cows.....	50	<i>Ft. in.</i> 4 2	<i>Ft. in.</i> 5 1
Oxen.....	30	4 4	5 0
Female calves (yearlings).....	30	3 10	4 6

The measurement of eighty animals at maturity gave average height, 4 feet 1 inch; length, 4 feet 10 inches.

The weight is as follows:

	Pounds.
Calves at the time of their birth.....	70 to 85
Animals of one year.....	430
Animals of two years.....	775
Cows reach a weight of.....	900
Oxen reach a weight of.....	1,100
Bulls reach a weight of.....	1,800

MEASURES OF SEPARATE LIMBS.

The length of the neck is on an average 1 foot 2 inches. The skin of the neck is fine and wrinkled. The withers are large and round, and are in a horizontal direction with healthy animals. The loins have an average length of 14 inches.

Average measurement of different parts of animals.

Kind.	Number of each measured.	Head between the horns from frontal bone to cleft of lip.	Width of forehead between the temples.	Length of back from shoulder to last rib.	Length of shoulder.
Cows.....	10	<i>Ft. in. Inches.</i> 1 8 7	<i>Inches.</i> 22	<i>Inches.</i> 30	<i>Inches.</i> 18
Female calves.....	10	1 7 6	20	18	18
Bulls.....	9	1 9 8	21	21	21

BREEDING AND FEEDING.

By far the greater number of the calves that are born each year are raised; the price is invariably high, so that the butchers are often obliged to take their supply from other sections. Some of the male calves are sold after twelve or fifteen months for breeding; the majority of the males, however, are castrated after six or eight weeks and sold after two years or kept for labor.

Most of the Messkirch stock-breeders let the calves (male as well as female) suck during six or eight weeks. After that time the calf gets

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Average height. Average length.

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5	10	4	6

average height,

Pounds.	
70 to 85	
430	670
776	1,030
900	1,400
1,100	1,300
1,800	2,400

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Heads.	Inches.	Inches.
7	22	20
2	20	18
	21	21

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male as well as the calf gets

sweet creamed milk with some corn-meal in it, and a little hay; this is continued for six months, then the calf gets, during three months, hay and water mixed with salt and corn-meal.

In winter the food of the grown up cattle consists of hay, chopped straw, and beets; twice a week they get a mixture of malt and oil-cake. The cattle of the small farmers are mostly fed upon straw and very little hay and very often on beets. In summer the food consists of Swedish and lucern clover. The stables are very defective and unhealthy for the cattle. The greater part are too low, too small, and often overcrowded. Good and spacious stables with excellent ventilation are found on the large farms. The temperature in the stables of the little old farm houses is always too warm, but notwithstanding, the health of these cattle is excellent; this is partly explained by the fact that they are used to poor quarters; it also demonstrates that they are very hardy stock and do better under such circumstances than any other breed of cattle.

MEAT PRODUCTION AND FATTENING.

Calves which are sold three or four weeks after their birth to butchers, have a live weight of 100 to 120 pounds; calves which suck good milk have a weight of from 250 to 300 pounds after two to three months. The average price paid for calves by butchers is as follows: calves from three to four weeks old, \$10; two to three months old, \$30; three to four months old, \$45.

An ox of first quality, having a weight of 1,500 pounds, produces 840 pounds of meat, 120 pounds of tallow, 100 pounds skin, and 100 pounds must be deducted for the head, feet, and bowels.

An ox of second quality produces 680 pounds of meat, 60 pounds of tallow, 100 pounds skin.

A cow of first quality, of a live weight of 1,300 pounds, produces 680 pounds of meat, 90 pounds skin, 100 pounds of tallow.

A cow of second quality produces 550 pounds of meat, 80 pounds of tallow, 90 pounds skin.

The average is about 103 pounds of meat to 200 pounds live weight.

MILK PRODUCTION.

In the years named eighteen cows produced the following:

Years.	Quantity of milk.	Price per liter.	Total value.
	Liters.	Cents.	
1875.....	27,100	4	\$1,084
1879.....	26,138	3½	915
1880.....	27,422	3½	950
Total.....	80,660		2,949

From this must be deducted milk used in the house, 3,285 liters, milk for food of sixteen calves which are born on an average in a year, at 1½ gallon a day during two months, 5,760 liters, leaving a total of 71,615 liters or 17,904 gallons.

A cow of the Messkirch breed produces each day on an average 1½ gallons of milk, or 540 gallons a year in three hundred milk days.

The specific gravity of the milk, fresh from the cow, is from 29 to 33 per cent. After twenty-four hours the cream shows 10 to 12 per cent.

One and one fourth gallons of milk furnish 1 pound of cheese; 6 gallons (24 liters) give 2 pounds of butter. In regard to milk production the Messkirch breed is not inferior to any of the best milk-producing breeds of Austria and Tyrol.

EXHIBITIONS OF CATTLE AND MARKETS.

At the International Cattle Exhibition at Vienna in 1873 the medal of progress was awarded to the Agricultural Association of Messkirch for the exhibition of twenty young cows and two bulls. At an exhibition in Mannheim in 1869 the above-named association obtained the first prize for a collection of the best breeding-cattle. Markets are held the first of every month in the cities of Messkirch, Pfullendorf, and Stettin. In 1880 there were sold at these markets about eight hundred and seventy oxen and cows and about sixteen hundred young cows. The Messkirch cattle have already found favor in several foreign countries. A great many young cattle are sold every year to the stock-breeders in Alsace, Wurtemberg, and even in Switzerland. Cows sell from \$70 to \$150, bulls from \$70 to \$100, and calves, from two to four months, for \$15 to \$25.

THE BAAR CATTLE.

The district called the Baar is a plateau in Eastern Baden, which is bounded on the north by the Black Forest, northeast by the Neckar, south by the Swiss Jura, and west by the Wutach Valley. This plateau extends from north with a slight descent towards the south. In the northern part of this plateau, extending in a southern direction, there are three parallel chains of mountains; The eastern chain is a branch of the Black Forest, and consists principally of limestone, with narrow strips of anhydrite; the middle chain commences at Donaueschingen, where the sources of the Danube are, and ends at Doggingen. These mountains consist mostly of shell-lime and dolomite. The western chain, which commences at Hochemmingen, in Wurtemberg, is of siliceous nature. At the foot of these three chains of hills commences a plain with rich meadows, which are abundantly watered by many little water-courses. This part of the Baar is one of the most fertile districts of Baden. The altitude of this plateau above the level of the sea is from 2,100 to 2,400 feet.

The Baar cattle are a checkered cattle; they are red, light red, and yellowish in color, mixed with white. The red spots are mostly on the back, neck, shoulders, flanks, and shanks. The breast, belly, and legs are generally white. The skin in general is colorless; the horns and hoofs are light yellow. The size of this variety is not always the same; in some parts of the district the oxen are much stronger and larger than in others, while the difference in the size of cows is not so considerable. The average height obtained by measuring thirty animals was: cows, 4 feet 1 inch; oxen, 4 feet 7 inches; bulls, 4 feet 4 inches. The length taken from the top of the shoulder to the upper part of the thigh is: cows, 5 feet; oxen, 5 feet 2 inches; bulls, 5 feet 2 inches. The height is consequently 81 per cent. of their length. The head of the Baar cattle is broad, strong, and bony. The forehead is straight, smooth, and without any cavities; it measures between the horns 8 to 9 inches, on the temples 9 to 10 inches. The upper end of the forehead is heavily covered with hair, which spreads downwards in the form of a semi-circle. The length of the forehead is 10 inches. The total length of the head is 1 foot 8 inches. The ears are straight, and stand in a horizontal posi-

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tion. The eyes are lively; the glance is clear, quiet, and attentive; the iris is of nice brown color. The nape is strong. The back is strong and muscular, but has the disadvantage of being somewhat too low and deep; the Badish veterinarians claim that this is caused by defective feeding during the time after the ablactation, and by the fact that the crib is placed too high for the young animals. The length of the back is: cows, 4 feet; oxen, 4 feet 1 inch; bulls, 4 feet 4 inches. The skin of the Baar cattle is rough and thick; it is a good tanning material on account of its durability.

The live weight of cows is from 1,000 to 2,000 pounds; oxen, which are not fattened, weigh 1,200 to 1,400 pounds; bulls reach a weight of 2,000 pounds. The sizes of the animals vary according to the section of country where they were raised, and the food and attendance which has been given to them.

The best and largest animals of the Baar cattle are to be found in the villages of Mundeltingen, Pföhren, Aasen, Sundthausen, Geisingen, and Unadingen, which are the central points of the breed. Twenty years ago they commenced introducing this breed into the Black Forest district, and it has flourished in the limestone section of this range of hills, but in the red sandstone district it has not done well, and few, if any, of these cattle are now to be found in that section.

The food and manner of feeding the calves is the same as with the Messkirch cattle. In summer the grown-up cattle are fed on clover, lucern, and esparcet grass. One-half of all the cattle are driven to the pastures. In winter the food consists of hay, straw, beets, lentils, &c. Oxen that are worked get mostly chopped straw and beets. In summer the animals are fed three times a day, in winter twice.

The different kinds of fodder cultivated in the Baar district are, the red clover, the white clover, and other grasses, such as *Lolium perenne*, *Italicum*, *Avena elatior*, *Dactylis glomerata*. Lucern and esparcet are cultivated on a large scale, as they furnish three crops a year. It is a general custom in this district to grow fodder plants on a field during two years, and to plant it with corn or barley the third year.

STABLES.

The stables are usually connected with the barns and dwelling houses. The height of the stables is on an average 8 feet, the width 10 feet; the length depends upon the number of cattle. The floors are mostly of wood; underneath the floor there are pits or reservoirs to receive the urine. Those stables I have seen were insufficiently ventilated and lighted. Cribs and racks are made of wood.

MILK PRODUCTION.

The cows of the Baar cattle are very abundant in milk. The average quantity produced by a middle-sized cow is 2,100 liters or 520 gallons per year. A cow specially fed is able to produce 2,600 liters, or 600 gallons. Three gallons of milk furnish 1 pound of butter, and $1\frac{1}{2}$ gallons produce 1 pound of cheese.

FATTENING.

The fattening has of late not made much progress, because cheap food, such as the distilleries and sugar factories can furnish, was scarce, and the existing breweries could not produce all the material required.

Another cause was the poor crops. The fattening of the oxen commences after three to four years. They fatten very easily; the back, the loins and the shanks are very fleshy. The meat, especially of animals which were not used for labor, is soft, succulent, and of excellent taste. The weight of the meat in proportion to the live weight is 60 per cent.

The Baar cattle are much used for labor, for the Baar district consists mostly of small farms and the farmers prefer oxen to horses for plowing the fields. The bony, strong, and stout constitution, the strong back and muscular legs, together with its safe gait, make the Baar cattle very useful for labor. Two oxen usually suffice to draw a plow.

The Baar cattle have been exported to different sections of Germany, where they have thriven well. They require less food and attendance than the Swiss cattle from the Canton Bern, from which the Baar cattle descends. For instance, trials having been made to keep Baar cows in the Black Forest have had good success, while the same trials made with Swiss cattle have entirely failed.

NUMBER OF CATTLE IN THE BAAR DISTRICT.

The number of cattle existing in the Baar district is 27,600 head. The percentage of the live stock as to age and sex, is as follows:

Cows	Per cent.
Young cows over 1½ years.....	39.7
Oxen over 1½ years.....	9.2
Cows from 3 to 12 months.....	15.5
Oxen from 3 to 12 months.....	13.0
Calves less than 3 months old.....	11.6
Bulls over 1½ years.....	9.0
Bulls less than 1½ years.....	0.8
	0.5

PRICES OF BAAR CATTLE.

Cows are worth from \$57 to \$120; pregnant cows from two to three years, \$60 to \$100; oxen from three to four years, \$70 to \$120; bulls, \$60 to \$90.

THE BLACK FOREST CATTLE.

The Black Forest variety exists all over these mountains, and can be called the proper original Baden cattle, except in a few districts contiguous to Switzerland, where they have been mixed with Swiss cattle. The first impression these animals make is not a good one. They are small, from 3 feet 4 inches to 3 feet 8 inches in length, and 3 feet to 3 feet 8 inches in height. The animals of the pure breed are light yellow; face and skull white; the shape is fine; the head broad, the same as to the snout; the horns are thin and not long; the back is short and straight; the flanks are strongly built; the shanks are muscular, but meager; the legs are vigorous, but often crooked; their gait is light and swift. As to character, these animals are very good-natured and tame. The bulls are very docile. Although the cows do not require much food, they produce about 450 gallons of milk in 300 days of the year. The meat of the Black Forest cattle is not as good as that of the other varieties of Baden. In summer the oxen and cows are driven to the mountain pastures; in winter they get hardly anything but chopped straw and hay to eat.

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The fact that this breed has remained pure during several centuries is explained by the fact that the farmers in the mountains do not have money enough to introduce foreign bulls. In the districts north from the Black Forest the fodder plants are more abundant, and the breed of cattle there, although bearing a great resemblance to the above-described breed, are much larger and more fleshy. The cattle of this district have been cross bred with Simmenthal and Baar cattle. The principal occupation of the farmers of this section is to raise young animals until they are two or three years old, and to sell them afterwards to the adjacent countries, such as Alsace, Wurtemberg, &c.

ODENWALD CATTLE.

In the Odenwald there is a breed which are adapted to the poorness of the soil (colored sandstone). These animals measure on an average 3 feet 10 inches in height and 4 feet 6 inches in length. The hair is generally brown; the head narrow and short; the back is a little bent; the legs are weak and the shanks thin. The milk production is not large, nor are these animals fit for fattening. Cows sell for \$35, oxen for \$30, and bulls for \$42.

THE NECKAR CATTLE.

In the northern hilly part of Baden, embracing the districts of Bretten, Bruchsal, Heidelberg, and Wertheim, exists a variety which is generally called the Neckar cattle. These cattle meet the requirements of the small farmers, as they reach maturity very fast. The average height is 5 feet 6 inches for oxen and 5 feet for cows. The average length for oxen is 5 feet, and for cows, 4 feet 10 inches. The color is mostly brown or brownish red; the head small, the neck short; back straight and fleshy; legs very short and muscular. The breed is less fit for dairy than for fattening.

Weight.

Description.	Meat weight.	Live weight.
	Pounds.	Pounds.
Ox of four years	600	1,020
Cow of three years	420	750
Calf of fourteen days	60	100

Bulls cost \$60 to \$75; cows, \$50 to \$60; calves, \$7 to \$9.

CATTLE CENSUS OF BADEN.

The Badish Government has done very much for the improvement of the live stock of Baden, especially by importations of Swiss spotted cattle (Simmenthaler), and by a law establishing the quality and number of bulls to be kept in every community. The last cattle census, made in 1880, states the total number of horned cattle in Baden to be 630,480 head; bulls, 8,397; cows, 474,555; oxen, 112,559; calves, 34,969. This gives an average number of 58 cattle to a square mile.

For the inclosed photographs of the Messkirch breed of cattle, I am indebted to the courtesy of his excellency the states minister of the Grand

Duchy of Baden, who, upon hearing that I was engaged in the preparation of a report on the Badish cattle, instructed the proper persons to have these photographs taken and sent to me free of charge.

FRANK M. BALLOW,
Consul.

UNITED STATES CONSULATE,
Kehl, Baden, October 14, 1884.

Special statistics of Badish cattle.

Name of breed and district.	Average milk in 300 days.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Size at maturity.				Live weight.		
				Average of 50 cows.	Average of 10 bulls.	Average of 20 oxen.	Average of 21 cows.	Bulls.	Average of 20 oxen.	
	Gallons.	Gallons.	Gallons.	Ft.	Ft.	Ft.	Lbs.	Lbs.	Lbs.	
Messkirch cattle; district of Messkirch, Baden	475 to 500.	3½	1½ to 1¾	4½	4½	4½	1,200	1,800 to 2,400	1,194	
Baar cattle; greater part of the district of Donauesschingen, Baden	500	3½ to 3¾	1	4	4½	4½	1,100	1,600	1,300	

MESSKIRCH CATTLE.

Maturity: Age, 1½ to 1¾ years, frequently 1 year; weight, 660 to 900 pounds; 430 to 600 pounds of meat, 52 to 55 per cent. of weight.

Color: Yellow, with white spots, sometimes red-yellow; nostrils colorless; horns and hoofs yellow.

Description: Fine shape, proportionately high and long; back straight; shanks and flanks vaulted; legs of middle length, muscular; the croup is about 2 inches higher than the withers.

Breeding: The breeding commenced forty-five years ago. The original cattle were the Swabian Alp, cattle of small size, one-colored, either red or yellow. It was very frugal and productive in milk.

Product: This breed is excellent for labor on account of their strength and endurance. They are much sold for fattening; the meat is healthy, succulent, and of excellent taste; milk very good, resembling Swiss milk, containing more caseine than any other breed.

BAAR CATTLE.

Maturity: Age, 4 years generally; weight, 500 to 1,000 pounds.

Color: Mostly white, with red, yellow, or brown spots on the flanks; head and feet white.

Description: Short, pointed head, fleshy shoulders, very straight back, and thin, short legs.

Breeding: This breed was never pure; it is a cross-breed of original South Baden cattle and Swiss bulls. Swiss bulls from Canton Bern were first introduced into this district about one hundred years ago.

Product: Very good for labor. The meat is of medium quality, milk of middle quality, and cheese good.

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Live weight.			
	Bulls.	Average of 20 oxen.	
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COW, MESSKIRCH BREED (BADEN)

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Histor. Museum, Berlin





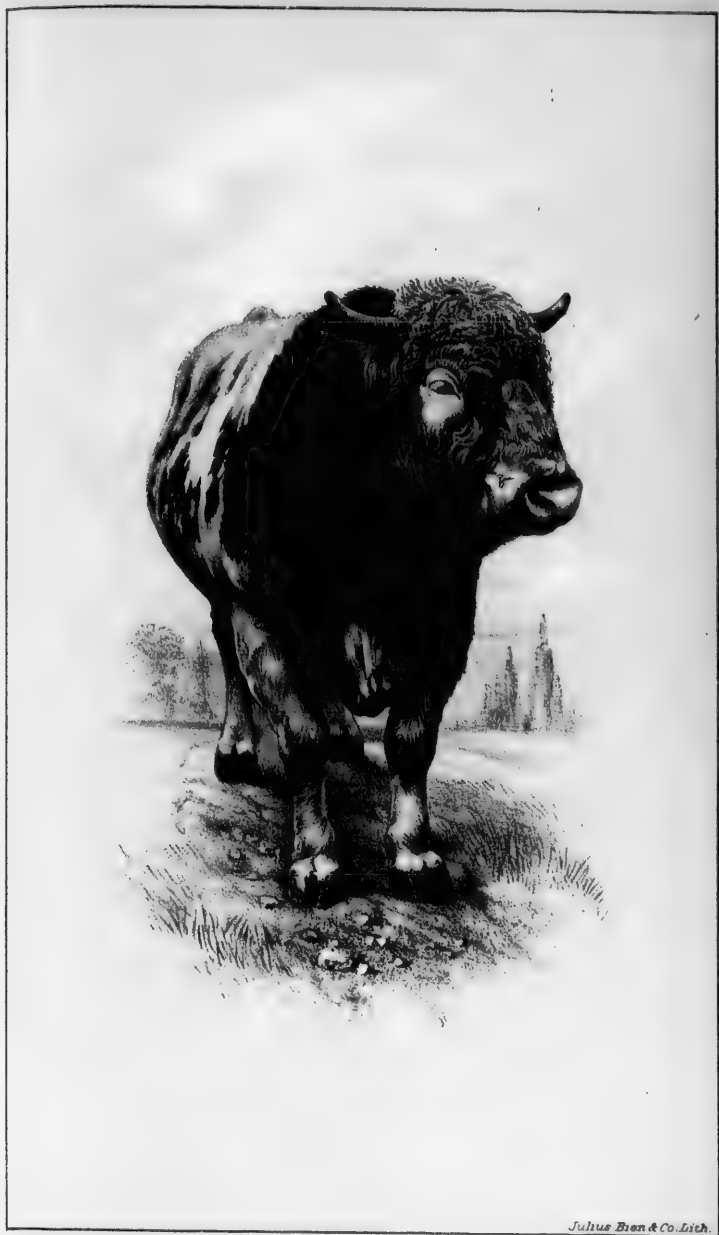
COM. MESSKIRCH BREED (BADEN)

Julius Bruns & Co. Leipzig



COW, MESSKIRCH BREED (BADEN).

Julius Bruns & Co. 1895.



BULL, MESSKIRCH BREED (BADEN)

BULLMESSKIRCH BREED 1806 N

W. H. & C. Co. Ltd.





Willie Brown & Co. Lith.

YEARLING, MESSKIRCH BREED (BADEN)

Julius Rosen & Co. Ltd.



Julius Bonk's Bild

I have the honor to inform the Department of Agriculture that the animals in the Grand Duchy of Baden are reared in a primitive manner, and that the grazing herds are not well managed.

Baden possesses a large number of cattle, and the Odenwalder, Messkircher, and Neckar districts are particularly famous for their cattle.

An important feature of the cattle-raising industry in Baden is the fact that the animals are fed on soil which is rich in lime and sand is not found. This lime exists, therefore, in the soil, and the animals are fed on fresh animals, and the countries have a large number of cattle.

The best cattle for export are those produced by a cross of the Messkircher and Odenwalder breeds, and the colors are generally red and white.

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CATTLE AND CATTLE PRODUCTS IN BADEN.

REPORT BY CONSUL SMITH, OF MANNHEIM.

I have the honor to report in reply to circular letter issued from the Department of State July 18, 1883, that the breeding of domestic animals in the Grand Duchy of Baden is conducted, in a very limited and primitive manner, by peasant farmers who occupy small farms. No large grazing herds are seen.

Baden possesses, peculiar to itself, four breeds of cattle, viz, Hinterwalder, Messkircher, Odenwalder, and Neckar.

An important result can only be realized in Baden when cattle can be fed on soil which has a substratum of lime. A substratum of granite and sand is not favorable to the growth of foreign cattle. Even where lime exists, refreshing of the blood is required by continued importation of fresh animals, especially male breeders. Breeds original to marshy countries have been transferred to the plains of the Rhine, where the soil is sandy, without success in retaining their original characteristics. The best cattle for transportation in Baden is a breed called Messkircher, produced by a cross with a Swiss breed called Simmenthaler. Breeders of cattle have ascertained to a certainty that the breed called Simmenthaler in South Germany is the best for crossing with other breeds, especially these brought up on a lime soil.

The colors are as follows:

Hinterwalder.—Dappled white and yellow.

Messkircher.—Dappled white and yellow and dappled white and red.

Odenwalder.—Grayish brown.

Neckar.—Dappled white and yellow.

The total number of cattle in Baden is 650,000.

The percentage of the different breeds is Hinterwalder and Messkircher about 60 per cent., Odenwalder and Neckar about 40 per cent.

The annual production of milk is about 480,000,000 liters.

The increase or decrease of cattle stock depends upon the crop and prices of hay, turnips, &c., such increase or decrease varying from 5,000 to 40,000 heads.

In 1876, when the crop of grass was very small, the total number of cattle in Baden was only 568,000; yet in 1879, when the crop of grass was plentiful, the total was 665,000.

The stock seems to be sufficient for demand. From the average stock of 550,000 head about 200,000 head are killed each year, enough for the general requirements of the people. There is not much meat eaten by the common people. Meat once a week is the usual customary diet.

There is no excess in the demand for foreign cattle. If cattle are imported they come from the adjoining countries of Wurtemberg and Bavaria. The insufficiency for a home demand is not noticeable.

On occasions when the crop of grass has been very poor in Upper Silesia and upon the marshy grounds of Holland, cattle have been sent from there to Baden and sold at low prices.

Cattle supplies are not drawn to Baden from the United States. The cattle of Baden are mostly, with a few exceptions in the Schwarzwald, stall-fed from their birth, making a different meat from that of the grazing animals of America. The meat of German stall-fed animals is hard and marbled with fat and lean.

Unless stall-fed cattle were sent to Baden the meat would be objected to by Badeners, who prefer lean stall-fed meat. Consequently the exportation of American cattle to Baden has not taken place.

For the transportation of cattle the best and usual method in Germany is by rail. Cattle are fed and watered in the rail wagons and on arrival at destination. The wagons are disinfected and fumigated with great care.

Sheep when transported long distances are taken from the wagons and allowed to graze several times upon their journey. The sheep, accompanied by a shepherd and his dog, are rapidly conducted to some neighboring field where good grazing can be found. When the whistle of the engine notifies the shepherd, he notifies the dog, who with astonishing rapidity collects the sheep, and with the obedience and precision of drilled soldiers they return to the wagons and proceed upon their journey.

The estimated expense for attendance and food *en route* is about \$5 per head from Mannheim to the seaport; the time employed about four days.

EDWARD M. SMITH,
Consul.

UNITED STATES CONSULATE,
Mannheim, January 25, 1884

Statistical table regarding the cattle of Baden.

Name of breed.	County or district.	Annual average production of milk per cow.	Size at maturity.			Age at maturity.	Live weight.		
			Cow.	Bull.	Ox.		Cow.	Bull.	Ox.
						Years.	Kilos.	Kilos.	Kilos.
Hinterwälder (Black Forest).	Black Forest.	1,000 to 1,800	1.05	1.10	1.18	5	300	450	500
Messkircher.	Boden-See	1,200 to 3,000	1.40	1.50	1.60	4	500	800	900
Odenwälder.	Odenwald.	800 to 1,000	1.10	1.20	1.30	5	300	400	450
Neckar.	Neckar	1,200 to 3,000	1.30	1.50	1.60	4	400	800	900

County or district.	Topography.				Soil.	Substratum.
	Altitude above sea-level.	Mean temperature.	Summer.	Winter.		
	Meters.	°C.	°C.	°C.		
Black Forest.	700 to 1,000	8	16 to 18	2 to 5	Loam	Granite, gravel.
Boden-See.	500	8	16 to 18	2 to 5	Alluvial, loam, and clay.	Limestone.
Odenwald.	300	8	16 to 18	2 to 5	Loam, sandy.	Sandstone.
Neckar.	800	8	18 to 20	4 to 6	do	Limestone, gravel.

REMARKS.

Hinterwälder.—This is a home-bred race, of a dappled white and yellow color; they are useful as work cattle, for their meat, and for milking. The yield of milk is large and of good quality; 24 pounds of milk produce 1 pound of butter; 10 pounds of milk 1 pound of cheese. In summer they are put out to graze, and in winter stall-fed.

Messkircher.—This is a home-bred race crossed with Simmenthal; they have been bred pure for about fifty years, the original coming from Switzerland. The color is white and yellow and white and red. As milkers and butter producers they rank with the Hinterwälder, and are used for the same purposes. Stall-fed.

Odenwälder.—work cattle and little cheese made. Neckar.—A breed from Switzerland; the color is dappled white and yellow, and are stall-fed. The weight of the manufactured cheese is made. The ordinary potatoes. Time point, and does used for home consumption.

The neat draft, beef, milk, and the Shorthorn. The use of dairy qualities has probably command the beef must not strength in rarity. The ordinary long, lying and either singly or

It is only worth for dairy species has had time to the fact has no Bavaria has has no world-famous but not in large dairy produce that there will of neat cattle. many years to

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It is impossible to name a place where. As the difference great, the average from the following

Odenwalder.—This race is home-bred, of a grayish-brown color; they are used as work cattle and are good milkers; 24 pounds of milk yield 1 pound of butter; very little cheese manufactured. Stall-fed.

Neckar.—A home-bred race crossed with Simmenthal, the original coming from Switzerland; they have been bred pure for about fifty years. In color they are dappled white and yellow. As milkers and butter producers they rank with the *Odenwalder*, and are used for the same purposes. Stall-fed.

The weight of meat at maturity in all of the above is one-half of the live weight.

The manufacture of cheese is insignificant; only some common cream and hand cheese is made.

The ordinary method of housing is pursued; hay after-grass, roots, turnips, carrots, potatoes. Timothy, clover, rye, grass, &c., grow everywhere. Breeding is at a low point, and does not furnish a good example for other countries. Products are mostly used for home consumption.

BAVARIAN CATTLE.

REPORT BY CONSUL HARPER, OF MUNICH.

The neat cattle of Bavaria are good for the combined purposes of draft, beef, milk, butter, and cheese, but no variety among them equals the Shorthorn, the Jersey, or the Holstein in its specialty.

The use of the ox extensively and of the cow occasionally for draft has probably been the main obstacle to the differentiation of superior dairy qualities in Bavaria, as well as in some other countries of continental Europe. The breeds that would take the highest prizes and command the highest prices for the production of butter, cheese, and beef must not be praised as the Bavarian cattle are for speed and strength in harness. The yoke, if not unknown here, is at least a great rarity. The ox pulls by traces, attached to a stick about 16 to 18 inches long, lying across his forehead and tied to his horns; and he works either singly or in double team, as occasion requires.

It is only within a generation or two that the breeding of neat cattle for dairy specialties has been commenced in Bavaria, and if any variety has had time to acquire a definite character with surpassing excellence, the fact has not yet been made known by general reputation.

Bavaria has no dairy product celebrated for quality or quantity. It has no world-famous brand of butter or cheese. It exports beef cattle, but not in large numbers. It will probably never import much beef or dairy produce from any source; nor do I see any reason to anticipate that there will ever be any very great increase or decrease of the stock of neat cattle. The dairy breed will doubtless continue to improve for many years to come.

Since, in my opinion, there are no neat cattle here that can be exported to the United States with profit, I have not thought it desirable to study the methods, routes, and costs of exportation.

JOSEPH W. HARPER,
Consul.

UNITED STATES CONSULATE,
Munich, January 14, 1884.

TOPOGRAPHY AND TEMPERATURE OF BAVARIA.

It is impossible to give the exact average temperature of entire districts, but only to name a place which represents the temperature of the climate in each district.

As the difference of the temperatures in the whole Kingdom of Bavaria is not very great, the average variation of temperature may be stated as inside 0.5°, as appears from the following table.

The heights and temperatures refer to each selected place in the named district.

District.	Representative place.	Altitude.	Temperature (centigrade), 1870-1882.		
			July.	January.	Year.
Upper Bavaria:		<i>Feet.</i>			
Near mountains.....	Munich.....	1,680	16.99	-3.96	7.64
Mountains.....	Traunstein.....	1,939	17.16	-4.27	7.07
Lower Bavaria:					
Near Kelheim.....	Regensburg.....	1,105	17.28	-3.94	8.37
Palatinate:					
North.....	Grunstadt.....	541	18.88	-2.77	9.04
South.....	Landau.....	470	18.89	-1.64	9.41
North Upper Palatinate.....	Weiden.....	1,290	16.85	-4.47	7.62
Upper Franconia:					
Main valley.....	Bamberg.....	784	17.41	-3.99	7.76
Fichtel Mountains.....	Bayreuth.....	1,119	16.52	-4.73	7.69
Middle Franconia.....	Ansbach.....	1,320	16.60	-4.52	7.33
Lower Franconia, main valley.....	Wurzburg.....	693	18.39	-4.11	8.68
Swabia.....	Kempten.....	696	16.50	-5.69	6.65

The above figures are calculated by the Royal Bavarian meteorological central station.

SOIL OF BAVARIA.

Alluvial: Alluvial soil exists in the valleys of all larger rivers of the country, principally those of the Danube and its tributaries and of the Rhine and Main. The alluvial formations of the Danube consist principally of coarse and fine sand and marly deposits. The same character pervades the alluvial of the tributaries of the Danube coming from the south, viz, Iller, Lech, Isar, and Inn. In those tributaries rising in the north, viz, the Naab, Regen, and Ilz, as alluvials, quartz, mountain pebbles, and sand loam predominate; but in the valleys of Laber, Altmühl, and Wörnitz limy alluvials abound.

The alluvials of the Rhine consist chiefly of quartz, pebbles, clay, and sand. In the Main Valley we find mountain gravel and sand only here and there. Near Würzburg limy pebbles are found.

Loam: Supposing loam ground to be the opposite of limy or marly clay ground, the following are the principal localities where it is found: (1) A great part of the Bavarian Alps, in Upper Bavaria and Swabia. (2) In the Bavarian plateau south of the Danube, of Swabia, Upper Bavaria, and Lower Bavaria. (3) In the territory of Franconia-Jura, from Ulm over Nordlingen, Eichstadt, and Regensburg, northward to Bayreuth and Lichtenfels, in the districts of Swabia and Upper Palatinate, Middle Franconia and Upper Franconia. (4) In the shell-lime plateaus between Rothenburg, Würzburg to Kissingen and Melrichstadt, in the districts of Middle and Lower Franconia. (5) On the shell-lime plateau of the Palatinate, from Homburg, Bieskastel, Pirmasens, over Zweibrücken, Sickingen-High, to Landstuhl, and in the plain of the Rhine.

Clay: Under the supposition concerning loam ground above mentioned, clay abounds, mixed with sand, in the following districts: (1) In the mountain districts of the Bavarian and Upper Palatinate forests, districts of Lower Bavaria and Upper Palatinate. (2) In the Fichtel Mountains and in the district of Upper Franconia. (3) In some places in the Keuper territory, in the district of Middle Franconia, and finally in the coal territory of the western part of the Palatinate.

Sand: Sand soil predominates here and there, mixed with loam, in the Molasse territory of the Alps of Upper Bavaria and Swabia. Clay sand exists in the mountain districts of East Bavaria, Upper Palatinate, and Lower Bavaria, and in the granite mountains of Fichtel, in Upper Franconia, and in the Keuper territory of Middle Franconia, Upper Franconia, and a part of Upper Palatinate; also in the territory of the colored sandstone in Lower Franconia (Spesshardt) and at the end of the Harz Mountains of the Palatinate.

SUBSTRATUM.

Limestone: Limestone is the substratum of the soil in the following sections of the country: (1) In the Alps, Upper Bavaria, and Swabia. (2) In Franconia, Jura, mouth of the Danube (a small spot excepted between Abensberg and Regensburg), in the districts of Swabia, Upper Palatinate, Middle and Lower Franconia. (3) In the shell-lime territory of Middle, Lower and Upper Franconia. (4) In the shell-lime

district of South Mountains.

Sandstone: Sandstone is the substratum of the country: districts of Upper and Middle, Lower Franconia forests (5) Mixed with Harz Mountain limestone.

Granite: Granite is the substratum in the following districts of Bavaria. (2) In the middle of the Upper Franconia (tenburg).

Clay: Claystone is the substratum of Upper Palatinate, the Fichtel Mountains, sandstone in the Upper Palatinate. (5) In the Rhine Valley.

Gravel: Gravel is the substratum of Upper and Lower

Timothy: Timothy is the substratum of those districts where the development of 1878 in Bavaria 1 cattle.

Clover: Red clover is the largest acreage of Franconia, the State all kinds of soil cultivation, has become cultivated with such pastures. Lucerne, Esparsette clover, lime districts. The best in the wine region seed clover.

Rye grass, &c.: Rye grass is cultivated seldom as hay, cultivating new kinds of clover. (*Avena sativa*) is the best in the wine region kinds of clover.

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Methods of housing: built. The recent open drains. In the ventilated.

Feeding: In the between May and only put out to feed.

The pasture in manured and char Upper Bavaria the

In general the fodder cultivation, of vegetable waste

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ture (centigrade),
1879-1882.

January. Year.

-3.96	7.61
-4.27	7.67
-3.94	8.37
-2.77	9.04
-1.64	9.41
-4.47	7.62
-3.90	7.76
-4.73	7.09
-4.52	7.33
-4.11	8.68
-5.09	6.65

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district of Southwest Palatinate, and on a small strip on the east line of the Haardt Mountains.

Sandstone: Sandstone formations exist in the substratum of the following sections of the country: (1) Marly sandstones alternate in the south Bavarian plateau of the districts of Upper Bavaria, Lower Bavaria, and Swabia. (2) In the Kemper Mountains of Middle, Lower, and Upper Franconia; also in parts of the Palatinate. (3) Clay slate alternates in the northwest parts of the Fichtel Mountains and in the Franconia forests. (4) In the Spesshardt and adjoining sections of Lower Franconia. (5) Mixed with basalt, in the Rhone Mountains of Lower Franconia. (6) In the Haardt Mountains of the Palatinate. (7) In the coal districts of the western Palatinate.

Granite: Granite and mountain rock (gneiss unicalate) compose the substratum in the following districts: (1) In the Bavarian and Neuburger forests and Lower Bavaria. (2) In the forests of Upper Palatinate, along the line of Bohemia. (3) In the middle of the Fichtel Mountains, and in the Munchberg gneiss circle, district of Upper Franconia. (4) In the Lower Spesshardt, near Lower Franconia and Aschaffenburg.

Clay: Clay-stone (clay-slate, coal-slate, potter-slate) is found: (1) In the northern part of Upper Palatinate (environ of Waldsassen). (2) In the clay-slate district of the Fichtel Mountains and Franconia forests (Upper Franconia). (3) Mixed with sandstone in the Kemper districts of Upper, Middle, and Lower Franconia, here and there in the Upper Palatinate. (4) In the coal mountains of the western Palatinate. (5) In the northern part of the Bavarian plateau, particularly near Straubing, Pfaffenhofen, in the main district of Lower Franconia, and in the plain of the Rhine Valley.

Gravel: Gravel in a conglomerated form is found in the territories mentioned as of alluvial soil, principally at the base of the Alps extending through the districts of Upper and Lower Bavaria and Swabia.

CULTIVATED GRASSES.

Timothy: Timothy (*Phleum pratense*) is cultivated in preference, but not often, in those districts where there are no meadows, mixed with clover and other grasses for the development of new meadows. According to the cultural statistics of the year 1878 in Bavaria 10.1 per cent. of the total average is cultivated as grazing land for cattle.

Clover: Red clover (*Trifolium pratense*) is cultivated most, and monopolizes the largest acreage of land. It is used green or as dried clover hay. For green fodder in Franconia, the Steyermarker green clover is preferred. Red clover prospers in nearly all kinds of soil where the vegetation of this specialty, because of too frequent cultivation, has become uncertain; there the Swedish clover (*Trifolium hybridum*) is cultivated with success. White clover is chiefly cultivated for specially-made sheep pastures. Lucern clover (*Medicago sativa*) is most in favor on the Jura plateau. Esparsette clover (*Onobrichis sativa*), Turkish clover, is cultivated chiefly in the shell-line districts. French clover (*Trifolium incarnatum*) is uncertain; it prospers the best in the wine regions and is mostly cultivated as a substitute in case of failure of seed clover.

Rye grass, &c.: Italian rye grass mixed with red clover instead of clover is cultivated seldom as hill-side seed; also mixed with other kinds of grass and clover for cultivating new lands. The English rye is but seldom cultivated. The French rye (*Avena elatior*) is used as a top grass for cultivating fodder grass mixed with different kinds of clover.

HOUSING, FEEDING, AND BREEDING CATTLE IN BAVARIA.

Methods of housing: The stables are, with few exceptions, good ones, and solidly built. The recently built ones are mostly with iron arches, stone pavement, and open drains. In the mountain regions the stables are still of wood, low, and badly ventilated.

Feeding: In the mountains a greater part of the cattle feed in the Alpine pastures between May and October. On the plains they are generally fed in the stables and only put out to fall pasture after the meadows are mowed.

The pasture in the Alps, where no overcrowding takes place, where pastures are manured and changed, is excellent, particularly in Allgau. In the mountains of Upper Bavaria the Alpine economy is still not as good as it should be.

In general the feeding of cattle has become better in consequence of more extended fodder cultivation. The vegetable cultivation has increased considerably and the use of vegetable waste and strong fodder is important.

In places where the cultivation of grain is carried on to a disproportionate extent or where horse-raising prevails, the neat cattle still suffer for the want of food, as in Ingolstadt, Straubing, and in the whole Roththal Valley.

Breeding: Where the breeders possess sufficient knowledge, and understand the superiority and value of native pure-bred stock, their avocation is lucrative. Numerous unions have been formed for the encouragement of improvements in breeding stock. Some years ago a preference existed in favor of the Simmenthal cattle from Switzerland, which were frequently crossed with other breeds. Now this method is disappearing, and the conviction prevails that when well cared for and well bred the Bavarian cattle are equal in every way to the Swiss.

HANDLING CATTLE PRODUCTS IN BAVARIA.

The most of the Bavarian breeds furnish excellent cattle for working and fattening, and the Bavarian beef is well and favorably known at home and abroad and commands a good price. The oxen are the principal source of income of cattle-breeders, and they are bred with excellent judgment. Being trained to work they are much sought after in the many cattle markets by dealers from other countries, especially from North Germany, where, after they are three or four years old, they are worked and then fattened.

The Bavarian oxen are easy going, fast steppers, represented to be better than horses in pace, and are very enduring, tough, good and frugal eaters, fatten quickly, attain heavy weights, and furnish a tender and palatable meat.

The dairy business is carried on largely only in the south of Bavaria, but, since the last five years, has been extending. The Allgäu cheese now compares favorably with Emmenthal, but, as yet, in quality, is not quite its equal.

Bavarian table butter from the centrifugal dairies goes in large quantities, mostly in an unsalted state, to North Germany and, slightly salted, to England. With the increase of dairies, breeding and fattening of hogs has also increased, both in quantity and quality in Bavaria.

Special statistics of Bavarian cattle.

Name of breed.	Annual average of milk.		Milk to pounds of butter.	Name of district.	Height from ground to withers.			Length of body.			Girth behind the shoulders.		
					Cow.	Bull.	Ox.	Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
	<i>Lbs.</i>	<i>Quarts.</i>			<i>Ins.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>Ins.</i>
Pinsgauer *	5,500	10.5 to 12.3		Upper Bavaria...	53.1	52.2		62.0	61.0		78.7	81.8	
Miesbacher*	5,060	10.5 11.4		do	55.1	55.1	64.0	66.1	66.1	66.1	79.0	78.7	94.4
Simmenthaler*	5,500	10.5 11.4		Dispersed through nearly all Bavaria.	56.6	55.5	181.5	91.0	61.0	67.3	87.0	67.8	791.3
Ansbacher*	5,500	10.5 11.4		Middle Franconia	52.3	52.7		61.4	62.9		76.7	77.9	
Kelheimer*	3,300	9.6 11.4		In Middle Franconia and Lower Bavaria, and especially in Upper Palatinate.	52.3	54.1	3.60	56.2	9.62	9.62	76.7	81.8	78.7
Allgauer*	6,600	9.6 11.4		In Swabia, Neuburg, Upper Bavaria, and partly in the remaining districts.	51.2	55.1		61.0			71.9	77.1	
Glan Donnersberger†	4,400	10.5 12.3		Palatinate	51.2	53.5		61.0	61.9		71.3		
Scheinfelder†	4,400	10.5 11.4		In the three Franconia districts and in the Upper Palatinate.	55.1	55.1	61.4	62.9	61.4	60.9	77.5	77.1	84.6
Ellinger†	5,500	10.5 12.3		Middle Franconia.	53.1	53.9		61.0	62.9		78.7	80.3	
Voigtlander†	3,300	10.5 11.4		Upper Franconia and Upper Palatinate.	49.8	51.2	60.5	57.1	62.9	66.9	72.3	73.8	83.6
Murnau-Werdenfelse†	4,950	10.5 11.4		Upper Bavaria	50.0	53.5	63.7	61.0	57.0	62.9	70.9		
Bayreuther Schecken†	4,400	10.5 11.4		Upper Franconia									

* To make 1.1 pounds of fresh cheese it takes from 22 to 26.4 pounds of rich milk; 28.2 to 33 pounds of half skimmed milk; 33 to 37.4 pounds of skimmed milk.

† For 1.1 pounds of Limburger cheese it takes 7.9 quarts of sour milk; 4.4 to 5.2 quarts of good milk; 5.2 to 6.1 quarts of half-skimmed milk.

Name of breed

Pinsgauer

Miesbacher

Simmenthaler

Ansbacher

Kelheimer

Allgauer

Glan Donnersberger

Scheinfelder

Ellinger

Voigtlander

Murnau-Werdenfelse

Bayreuther Schecken

* Of this weight it are included.

Of all the races three years of age five years of age. At the end of the

Special statistics of Bavarian cattle—Continued.

Name of breed.	Live weight.			Percent of meat at maturity to live weight.*	Color.	Description of.
	Cow.	Bull.	Ox.			
	<i>Cwt.</i>	<i>Cwt.</i>	<i>Cwt.</i>			
Pinzgauer	11.8-15.7	12.7-15.7	14.7-19.6	52-56	Red, brown, and white on the back.	Well-formed animals, with deep body and good developed flesh.
Miesbacher	9.8-13.7	13.7-17.7	13.7-17.7	47-49	Yellow and spotted.	Middle to large, rather fleshy; large-boned.
Simmenthaler	11.8-17.7	17.7-19.6	15.7-17.7-19.6	47-49	do	Very large and heavy; fleshy; long legs and large-boned.
Ambacher	11.8-13.7	11.8-17.7	15.7-17.7	50-52	do	Large and heavy, some with long legs; found chiefly in the low grounds.
Kelheimer	8.8-10.3	9.8-11.8	12.7-15.7	50-55	Red brown, with spot on the head.	Light to medium weight; well-proportioned; very frugal and tough.
Allgauer	7.8-9.8	8.8-12.7	9.8-15.7	50-55	Plain gray	Light to medium weight; well-proportioned, with good milk marks.
Glan Donnersberger ..	7.8-13.7	10.8-14.7	14.7-17.7	50-55	Plain yellow, with light marks.	Medium weight, with fair forms; fine; good milk marks.
Scheinfelder	8.8-10.8	11.8-15.7	12.7-16.7-19.6	50-55	do	Medium weight, with fair forms; fine; good milk marks; excellent for work and fattening; particularly used in North Germany, and in much demand.
Ellinger	8.8-11.8	11.8-16.7	12.7-16.7-19.6	50-55	Plain yellow, with dark marks.	Do.
Voigtlander	7.3-9.3	7.8-11.8	13.7-15.7	52-60	Plain light brown, with light mouth.	Medium weight, with excellent body; very straight and deep; in much demand.
Munau-Werdenfelser ..	6.8-9.8	8.8-12.7	9.8-15.7	52-56	Plain yellow-brown, with dark marks.	Rather large; well formed; delicate.
Bayreuther Schecken ..	8.8-12.7	11.8-15.7	11.8-17.7	47-49	Yellow and red, spotted.	Large to heavy; rather fleshy; large-boned.

* Of this weight it is understood that the meat in the four quarters, with tallow and kidney grease, are included.

Of all the races the Miesbacher and Simmenthaler are the most mature at two to three years of age. The Kelheimer, Scheinfelder, and Voigtlander mature only at five years of age.

At the end of the first year all these animals reach half of their weight at maturity.

Name of breed.	How long bred pure.	Origin of breed.	Working quality.	Product.	
				Meat.	Milk.
Pinzgauer	A century ..	Bavarian race	Excellent.	First rate	Fair and very good quantity.
Miesbacher	30 years ...	Pinzgau and Simmenthal cross.	Fair	Much, but not fine.	Fair to good.
Simmenthaler ..	do	Swiss	do	do	Do.
Ausbacher	125 years ...	Ostfries and Bern	Excellent.	Fair	First rate.
Kelheimer	A century ..	Bavarian race	do	do	Fair.
Allgauer	do	Swiss (gray and brown)	do	Little and indifferent.	First rate.
Glan Donnerberg.	do	Bavarian race	do	Fair	Good.
Scheinfelder ..	do	do	do	do	Fair.
Ellinger	60 years ...	Red Bavarian and Allgau mixed	do	do	Fair.
Voigtlander ..	A century ..	Tyrol	do	do	Very good.
Murnau-Werdenfelder.	20 years ...	Gray Swiss, Wurzelthal, and Montemmer mixed.	do	do	Fair.
Beyrenthaler Schecken.	Still in formation.	Bavarian, mixed with Bern and Miesbach.	Fair	Much, but not fine.	Fair.

Cheese.—The dairy is developed mostly in Suabia and Neuburg, next in Allgau, where they make round cheeses like the Swiss in form, and in Upper Bavaria. In the last-mentioned places the milk is worked into butter and Limburger cheese. In the remaining part of Bavaria the dairy is not much developed, as they keep the cattle for purposes of breeding and fattening.

CATTLE IN THE DUCHY OF BRUNSWICK

REPORT BY CONSUL FOX.

In compliance with Department circular of July 18, received October 3, 1883, I have the honor to transmit herewith a report on the various breeds of cattle maintained in the Duchy of Brunswick. I hope to be able to make a supplementary report in regard to the subject at an early day.*

There are at present four representative breeds of cattle in the Duchy of Brunswick, viz, Holland, Oldenburg, Harz, and the common kind, so-called "Landviehrasse"; the two latter have their origin in the duchy. The Harz cattle, which were introduced some fifty years since, taking their name from the Harz Mountains, where they were first reared, and the common breed, which have existed from time immemorial, are crossed with the imported Holland and Oldenburg animals, the offspring resembling the latter to a great extent. The importation of the offspring into the United States could hardly be recommended, as the original breeds would most naturally have the preference. The Harz animal, on the other hand, has proven to be a most suitable one for the raw climate of the Harz Mountains, and attempts to cross them with other breeds in order to obtain better individual qualities have always resulted in failure, so that now the greatest care is observed to breed them as pure as possible. Wherever an intense system of agriculture is maintained, especially in those parts of the duchy devoted to the culture of the sugar-beet, and where food is plenty, the Holland and Oldenburg breeds are to be found, they having been either imported directly, bred from imported animals, or are the result of crossing. The

* "Harz cattle for export to the United States" immediately follows this report.

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keeping of these animals is dependent more upon economical than upon natural circumstances, and as my colleagues in the various districts will have given more perfect information in regard to them than I possibly can glean here, I have omitted them in filling out the forms sent by the Department. With good housing and feeding the Holland and Oldenburg cattle prosper as well here, and the yield both for dairy and butcher is as abundant, as in the lands of their nativity. I beg to inclose tables showing the number of cattle in Brunswick, as well as other statistics in regard to them taken from the official report of the Ducal Brunswick Bureau of Statistics for the year 1883. The percentage of the several breeds, as well as the percentage bred for dairy and for butcher is not to be obtained, since the animals are rarely reared for the butcher exclusively, but the cows and oxen are used first for several years for dairy and labor, respectively, before they are fattened for consumption. The stock is not sufficient to supply the demand; numbers of steers and pregnant heifers are annually imported from Holland and Oldenburg. For the beet-sugar industry a large number of Bavarian draft oxen are imported and a smaller number of Breitenberger and Glauer. Shorthorns are also imported and crossed to some extent, in order to increase the meat product. Swiss cattle are to be found only in small numbers. There is no export worth mentioning except to the neighboring Prussian province of Hanover and of fattened animals to the larger cities. In Hanover the Brunswick cattle are crossed with the local cattle in order to obtain draft animals.

WILLIAMS C. FOX,
Consul.

UNITED STATES CONSULATE,
Brunswick, December 4, 1883.

BRUNSWICK CATTLE STATISTICS.

Comparative statement showing the number of cattle in the Duchy of Brunswick in the years 1873-1883, with increase and decrease, respectively.

[From official census taken January 10, 1883.]

Districts.	Whole number counted.		Increase or decrease since 1873.		Average to 1 square kilometer.			Average to 1,000 inhabitants.		
	1873.	1883.	Increase; decrease absolutely.	Per cent.	1873.	1883.	Per cent.	1873.	1883.	Per cent.
I.....	3,325	3,244	- 81	-2.43	10.90	10.63	-0.27	245.95	226.40	-19.55
II.....	3,231	3,116	- 105	-3.26	10.73	10.30	-0.37	185.79	148.62	-37.17
III.....	21,675	22,878	+1,203	+5.55	19.43	20.51	+1.08	261.64	261.50	-0.14
IV.....	43,809	46,493	+2,684	+6.01	26.04	31.60	+2.65	401.09	404.09	+3.00
V.....	12,569	12,400	- 169	-1.27	28.89	28.49	-0.40	599.58	565.79	-33.79
VI.....	2,573	2,647	+ 74	+2.88	45.94	46.85	+0.91	611.01	626.81	+15.80
Total in duchy.	86,172	90,787	+4,615	+5.35	23.32	24.63	+1.31	350.41	343.48	-6.95

PRICES AND WEIGHT OF BRUNSWICK CATTLE.

TABLE B.—Statement showing selling price and live weight of cattle in the Duchy of Brunswick.

[From official census taken January 10, 1883.]

TOTAL SELLING PRICE.

Districts.	Calves not 6 weeks.	Calves from 6 weeks to 6 months.	Animals from 6 months to 2 years.	2 years and over.		
				Bulls (breeders.)	Steers and oxen.	Cows.
	<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>	<i>Marks.</i>
I	4,680	18,340	80,880	7,085	11,250	465,300
II	5,744	8,798	64,605	10,200	81,375	582,930
III	25,760	114,855	699,440	44,800	289,080	3,445,280
IV	58,730	374,940	1,809,400	206,400	1,711,000	8,157,000
V	19,410	84,770	300,000	20,000	77,100	2,130,800
VI	3,350	18,240	118,350	2,000	400	544,050
Total in duchy.	115,674	619,933	3,172,341	291,085	2,170,805	15,925,160

Description: Age at maturity, two and a half years; weight of meat at maturity, 350 to 400 pounds, unfattened; single colors, light reddish, brown, chestnut-brown to brown-black. Head comparatively broad and short. Horns not particularly fine; are turned back. Rump and tail epiphysis slightly high. Udders small. Legs short and fine-boned, small and very compact hoofs. They have been bred pure since 1830. The origin of breed was a cross of the local animals with those of Tyrol, and are splendid draft animals. The meat is of middling quality; milk fat and cheese good.

Topography: Altitude, 300 to 500 meter; mean temperature, 4.85° to 5° C.; summer, 11.56° to 12°; winter, 1.51° to 0.5°. Soil transition from loam and clay to sand.

Substratum: Ancient crystalline stone, graywacke, slate, and chalk, with mixture of diorite and porphyry.

Cultivated grasses: Red clover, *Trifolium pratense*, often mixed with timothy (*Phleum*), of late with *Arthyllis vulneraria*.

HARZ CATTLE FOR EXPORT TO THE UNITED STATES.

SUPPLEMENTARY REPORT BY CONSUL FOX, OF BRUNSWICK

Supplementary to my previous report on the subject, I beg to say that the best Harz cattle to import into the United States for breeding purposes would appear to be young animals, yearling bulls and heifers, and from three to four years old cows. The president of the Brunswick Central Agricultural Association, to whom I am indebted for information upon the subject, advises that in the event of the purchase of such animals being determined upon, the parties interested address Mr. Kreithierarz Troldenier, in Blankenburg, on the Harz. This gentleman is a member of the official commission charged with the selection of breeding animals for the duchy.

The price of the cattle will be about as follows:

Yearling bulls	\$47 60
Yearling heifers	35 70
Pregnant heifers	57 12
Young cows	83 30

L.E.

the Duchy of Thuringia

and over.

Cows and sons.	Cows.
<i>Marks.</i>	<i>Marks.</i>
11,250	465,300
81,575	582,130
280,080	3,443,280
711,600	8,157,800
77,100	2,150,800
400	544,050
170,863	15,325,160

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MARZ HULL



James Brown & Co. Lith.

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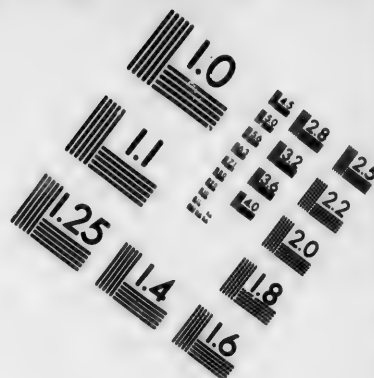
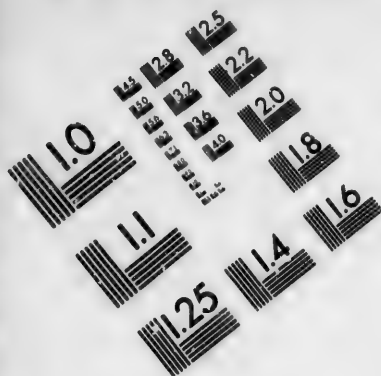
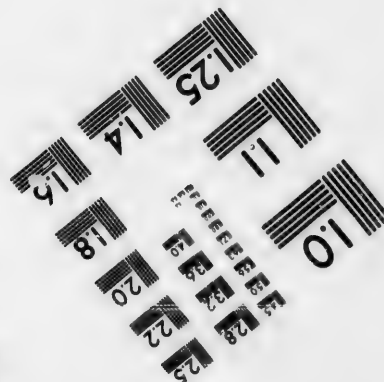
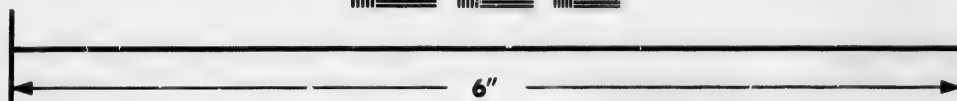
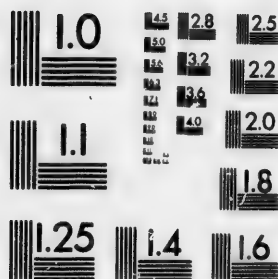


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HARRIS COW

Johns River Co. 1870



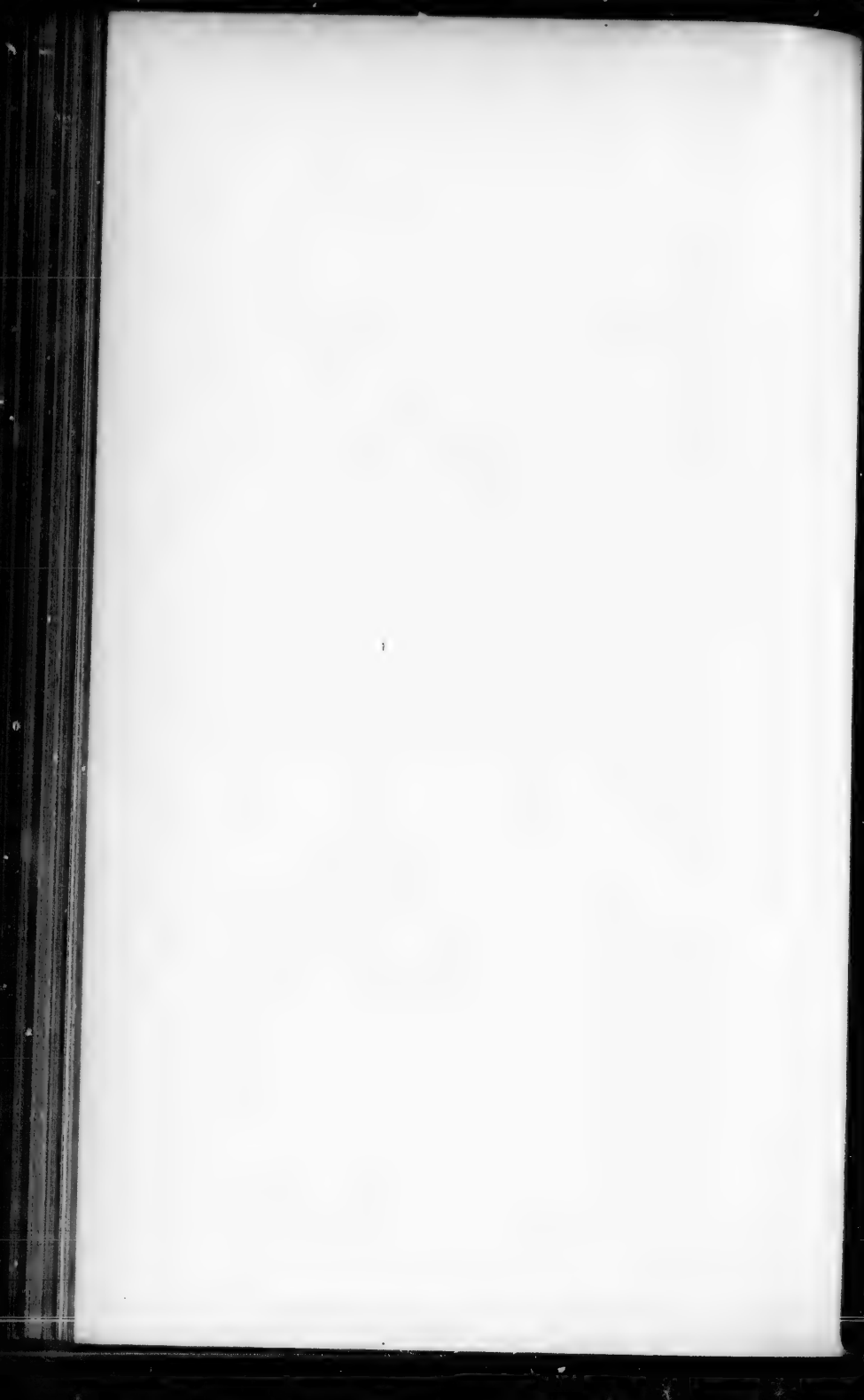
HARZ COW

Julius Brant & Co. Lith

HARZ COW



Fuller, Brown & Co. 1914.



Cost of transportation from Blankenburg to Hamburg and Bremen, respectively :

	Hamburg.	Bremen.
Single	87 49	87 04
Car-load (10 cows or 12 heifers)	27 11	23 97

Nine square meters is taken as half a car-load, in which four cows or five heifers can be placed. The person accompanying must be provided with a third-class railway ticket.

WILLIAMS C. FOX,
Consul.

UNITED STATES CONSULATE,
Brunswick, January 18, 1884.

SPECIAL STATISTICS CONCERNING HARZ CATTLE.

The following information was requested in order to properly locate, under similar conditions in the United States, such foreign domesticated animals as have proved by long experience to have been profitable in their native homes :

Annual average quantity of milk	liters* ..	1,200 to 1,600
Quantity of milk to 1 pound of butter	do	11 to 12
Quantity of milk to 1 pound of cheese	do	3
Live weight (cow)	pounds ..	700 to 800

Methods of housing : In summer the cows are driven into sheds at night; the heifers remain in the fields. On account of the scarcity of straw the animals stand on boards on which sawdust is strewn.

Feeding : Hay, with a supplement of corn.

Breeding : Breeding very extensive. Calves are suckled by the mother from six to eight weeks.

Handling products : The milk is placed in earthen pans; after the cream has been taken off, it is heated; small round cheese (Harzkäse) are manufactured from the curd.

CATTLE IN THE GRAND DUCHY OF HESSE-DARMSTADT.

REPORT BY COMMERCIAL AGENT SMITH, OF MAYENCE.

DESCRIPTION OF DUCHY.

I have the honor to make the following statement in response to circular instruction of the 18th July last, received October 3.

The Grand Duchy of Hesse-Darmstadt, within which this consular office is situated, lies between the degrees of 49° 24' and 50° 51' north latitude, and 25° 32' and 27° 19' east longitude, at the northern extremity of the upper valley of the Rhine, which stretches from Basle to Mayence, possessing a length of about 190 miles and a breadth of about 14 to 28 miles, with an elevation above the sea at Basle of 800 feet, and at Mayence of 268, and sinking from south to north. In Hesse-Darmstadt this valley has its greatest width and lowest depression.

The duchy is made up of three provinces, two of which are south of the river Main, and one north of it; between which two divisions runs

* 1 liter = 2.113 pints,

a narrow strip of Prussian territory, while the Rhine flows between the two southern provinces, which provinces are known as Starkenburg, Rhine-Hesse, and Upper Hesse. The area of the entire duchy amounts to 1,897,251.71 square acres, 746,285.22 in Starkenburg, 339,535.06 in Rhine Hesse, and 811,431.43 in Upper Hesse; upon which, in 1860, lived 636,340 human beings; 394,514 in Starkenburg, 277,152 in Rhine Hesse, and 264,614 in Upper Hesse. Of the 1,897,251.71 acres mentioned, 1,812,358.63 were devoted to agricultural, pasturage, vineyard, or forest purposes, as follows:

Provinces.	Farm and garden land.	Grass, meadow, and pasture land.	Vineyard.	Forest land.
	<i>Square acres.</i>	<i>Square acres.</i>	<i>Square acres.</i>	<i>Square acres.</i>
Starkenburg.....	312,860.105	85,453.69	1,644.36	311,937.13
Rhine-Hesse.....	264,536.165	15,150.65	23,101.46	16,337.40
Upper Hesse.....	368,088.125	147,860.15	45.27	262,714.83
Total in duchy.....	946,003.39	248,464.49	24,811.09	582,969.36

Starkenburg can be best designated as the district lying between the Rhine, Main, and Neckar, by which rivers it is almost completely encircled. The valley of the Rhine forms the western part of the province, to which on the north the valley of the Main is adjoined, while to the east of the former of these valleys and in a southerly direction from the latter runs the Odenwald Mountain range. This Odenwald is a wooded mountain district between Darmstadt and Heidelberg, and has a length of about 40 miles and a breadth of from 24 to 30. Its highest points are 1,959, 1,869, 1,834, 1,679, and 1,624 feet, respectively. More than one-half of Starkenburg is of a flat character, consisting, for the most part, of a sandy soil, which toward Odenwald seems to be much mixed with the remains of rocks of a primitive and volcanic origin, by which its bearing capacity is materially raised. Small scattered tracts of clay, clay marl, loam, and turf also appear, which bring about a high degree of fertility. In its most northerly part, in its foreparts, and throughout the Gersprenz Valley the Odenwald exhibits an exceedingly rich loamy soil; in its entire western part, so far as agriculturally available, it possesses chiefly a loamy to clayey soil; while in its entire eastern and southeastern parts a commoner loamy soil of colored sandstone prevails.

Rhine-Hesse is the most fertile of the three provinces, and the smallest. It is of a hilly nature, and is bounded on the north and east by the Rhine. Its soil is composed of intermingled areas of calcareous marl, clay marl, porous silicious earth, and chalky loam, not plastic, and quartz-sand. The soil of the province is throughout very rich, but suffers in certain places from dryness.

Upper Hesse lies high above the sea, and has no large plains. It is in part of an undulating character, and partly of a rough, unfertile mountainous nature. The eastern and western divisions of the province are wholly unlike, the soil of the western portion being very fertile, while that of the eastern is very poor.

CLIMATE OF HESSE-DARMSTADT.

In Starkenburg, in the valleys of the Rhine and Main, the climate is in general of a mild South-German type, which, in consequence of the vicinity of the wooded Odenwald and the influence of the Rhine and

Main, are subject to weather changes, and especially to fogs, while that part of the flat land lying between the Rhine and Odenwald, which is without forests, suffers in summer at times from dryness, because the storms and clouds upon passing the Rhine hasten to the Odenwald. The Odenwald, with slight exceptions, possesses a very fine mountain climate that is mild. The climate of Upper Hesse is much rarer than that of Starkenburg, and more like the climate of Northern Germany. Rhine-Hesse, hilly, poorly watered, and almost forestless, is a warm vineland, whose soil and air become very warm at midday during the summer months and quickly cool at eventide, so that in the spring time frosts at night are often productive of much damage to vegetation. The average temperature, full of rain, &c., of Hesse-Darmstadt, taken from the observations of fourteen years, from 1866 to 1879, inclusive, at Darmstadt, Starkenburg, Mayence, Rhine-Hesse, and Giessen, Upper Hesse, are :

Average temperature.

Seasons.	Darmstadt.	Mayence.	Giessen.
	° R.	° R.	° R.
Winter.....	+1.31	+0.3	+0.28
Spring.....	7.79	7.14	6.62
Summer.....	15.00	15.31	13.50
Autumn.....	7.02	7.81	6.88
For the year.....	8.005	7.642	6.840

Average fall of rain.

Seasons.	Darmstadt.	Mayence.	Giessen.
	c. c.	c. c.	c. c.
Winter.....	14.23	12.69	10.26
Spring.....	15.50	13.82	13.15
Summer.....	21.84	19.26	19.85
Autumn.....	16.90	15.12	16.20
For the year.....	68.56	60.89	65.57

Average number of rainy and snowy days each year.

Season.	Darmstadt.		Mayence.		Giessen.	
	Rainy.	Snowy.	Rainy.	Snowy.	Rainy.	Snowy.
Winter.....	30.40	14.80	31.00	13.10	38.50	18.00
Spring.....	47.14	4.93	40.80	4.93	42.00	6.08
Summer.....	49.01	.....	43.00	.....	48.21	.....
Autumn.....	43.50	3.80	38.00	1.70	43.50	3.80
For the year.....	181.04	23.53	152.80	19.73	172.21	27.28

CATTLE IN THE DUCHY.

Hesse-Darmstadt is adapted to the raising of cattle, but, in the translated language of the general-secretary of the Duchy, "the breeding of cattle in Hesse is an old, but alas, in no wise a very satisfactory story." The natural types of the cattle of the Odenwald* and Vogelsberg,* as well as those of the Donnersberg,* were of such a character that they

* Mountains in Hesse.

would have furnished an excellent basis for breeding purposes had the subject received that attention from the authorities and people that it eminently deserves, but, except by a few small farmers and communities, the matter has been neglected to such an extent that it has become a question of serious concern to all. The matter is further complicated by the fact that the small territory constituting Hesse-Darmstadt is owned by a host of proprietors, of which there are 165,535, or about that number, of whom 59 per cent. control less than 1 hectare;* 25.20 per cent., between 1 and 5 hectares; 10 per cent., between 5 and 10; 3.80 per cent., between 10 and 20; while only 2 per cent. hold more than 20 hectares. This, while advantageous to the people in one respect, is very unfavorable to cattle-raising. The Odenwald race has almost entirely died out, and the Vogelsberg, a small, strong species, good for food and draft purposes, is in nearly a similar condition. The Starkenburg and Rhine-Hesse cattle are now being somewhat improved in isolated quarters through the introduction of Simmenthal bulls. In years past the various agricultural associations endeavored to raise the character of the cattle of the Duchy, but want of proper fodder and other causes conspired to thwart their aims. The Schwytz Brown cattle were first tried until 1869, but it was found that they did not cross well with the native cattle of Hesse, and the spotted cattle of the Simmenthal, between which and the native races of Hesse a relationship is said to exist, are now being used with much better success. After this experience with the Schwitz the coarse, red-spotted cattle of the Bernese Oberland were selected, but as the milk-giving capacity of this species had received little or no attention from the Swiss it was discovered that a mistake had been made in turning to this variety, and in recent years the finer, yellow-spotted cattle, especially the Saanenthal, have been chosen in order to bring about an increase of milk, which trial has not been long enough in operation to state results to any extent. More attention is also being now given to the feeding of cattle than formerly. The chief obstacle, as already stated, in the way of successful breeding has been the want of ample pasturage, by reason of the small size in general of the farms in Hesse, and also the lack of encouragement from the state.

CATTLE STATISTICS OF HESSE-DARMSTADT.

According to an enumeration of cattle made in 1873, there were then in the Duchy the following number of animals:

Provinces.	Young cattle 6 months to 2 years old.			Animals over 2 years old.				Grand total.
	Cattle less than 6 months old.	Between 6 months and 2 years.	Bulls for breeding.	Total.	Breeding steers.	Other steers and oxen.	Cows.	
Starkenburg.....	12,104	23,156	524	62,036	624	3,913	57,409	97,296
Upper Hesse.....	15,748	31,507	661	79,909	717	8,737	70,455	127,234
Rhine-Hesse.....	5,423	11,113	455	42,993	342	1,017	41,634	50,529
Total Grand Duchy.	33,275	65,836	1,640	184,938	1,683	13,667	160,588	284,049

The Grand Duchy has in round numbers about nine hundred and forty thousand persons to nourish, who require per head on an average

*One hectare is a very little less than 2½ acres.

about 120 kilograms* of milk, 15 kilograms of butter, and 7.5 kilograms of cheese, amounting in all to about 600 liters† of milk each, and 560,000,000 liters for the entire population, that is, more than double the quantity which the Duchy itself produces, which in 1876 amounted to only 264,983,824 liters. According to the same statistics the average quantity of milk per cow was:

	Liters.
In Starkenburg, about.....	1,680
In Upper Hesse, about.....	1,500
In Rhine-Hesse, about.....	1,900
In Grand Duchy, about.....	1,650

It is also estimated that Hesse is obliged to draw annually from outside sources the flesh of about seven thousand five hundred and fifty oxen.

Hesse-Darmstadt thus presents a poor field to the view of those who are seeking fine types of breeding-cattle.

JAS. HENRY SMITH,

Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Mayence, November 23, 1883.

CATTLE IN THE RHINE PROVINCE.

REPORT BY CONSUL SPACKMAN, OF COLOGNE.

In reply to circular of July 18, 1883, requesting information as to cattle-breeding in this consular district, I have the honor to report as follows:

There is no cattle-breeding of any importance in the immediate neighborhood of Cologne. The stock in the greater part of this district is not sufficient for home demands, but the deficiency is generally supplied by Holland. In the whole Rhine Province the total number of cattle is about 1,700,000, including from 800,000 to 900,000 cows. The principal breeds are the Birkenfeld, Westerwald and Eifel, named after the sections of country in which they are raised.

THE BIRKENFELD BREED.

The best kind for export to the United States is the Birkenfeld. If well fed and properly cared for they grow very large and give a good supply of milk, they being stronger than the other kinds and better able to endure severe weather. This species is the same as the celebrated Oldenburg breed, Birkenfeld now belonging to the Duchy of Oldenburg and being a narrow strip of ground near Treves and south of the river Moselle. The cattle were formerly sent from Oldenburg to Birkenfeld, and have since remained a pure breed. At the age of four years the best animals command the following prices: For a cow, \$125 to \$150, and for an ox or bull, \$175 to \$190. A one-year-old bull costs from \$100 to \$115.

THE WESTERWALD BREED.

The Westerwald is a mountainous region east of the Rhine and between the valleys of the Sieg and Lahn, and the cattle in this district

* A kilogram = 2.2046213 pounds avoirdupois.

† A liter = 1.76077 pints.

are smaller than those in Birkenfeld and the Eifel, but the quality of their meat is much finer. A good cow costs about \$140, and an ox or bull \$165, while a one-year-old bull can be bought for \$75.

THE EIFEL BREED.

The Eifel is also a mountainous district, about 45 miles in length and 24 miles in breadth, situated between the rivers Rhine, Moselle, and Roer. The cattle here are very strong, and are used for agricultural purposes and often in place of horses. They are not recommended for export, on account of the peculiar country and soil to which they are accustomed. They cost about the same as the Birkenfeld breed, although they are much smaller.

HOUSING AND FEEDING.

The generality of these different breeds of cattle are kept in stables during a greater part of the year, and graze in the meadows after the grass is cut. Plenty of good water is indispensable to the health of the animals. While in stables, and if in the neighborhood of sugar-manufactories, they are fed upon the remains of sweet turnips, which are considered very excellent for food, and in other places they receive hay, bran, the refuse from distilleries, cut turnips, and oil and linseed cakes.

The only species which is in the open air most of the year is the Birkenfeld or Oldenburg. They give milk for almost nine months of the year, and during the first three months as much as the remaining six together, the quantity varying in the first months from 15 to 18 liters per day.

CATTLE-MARKET OF NEUSS.

The principal market for the sale of cattle is in the city of Neuss, not far from Cologne. Animals are sent there for sale from the Rhine Province, Birkenfeld, Holland, &c., and a large proportion of the buyers are Belgians.

SHIPMENT OF CATTLE TO THE UNITED STATES.

The most convenient and cheapest way of sending cattle to the United States from here is by rail to Antwerp, a distance of 157 miles from Cologne, and from there by steamers to New York. The cars vary in size, but one of 18 square meters accommodates nine cattle, and costs \$8.80 francs or \$17.14 to Antwerp. A man must be employed, at the rate of \$1.10 per day, to accompany the animals, and 75 cents is charged for cleaning and disinfecting the car at the end of the journey. Hay for feeding costs 40 cents, making the total expenses to Antwerp \$19.39, or \$2.15 for each animal. From there they can be shipped to New York in the steamers of the White Cross Line at the following rates: £6 (or \$29.20) each for full-grown cattle, £5 (or \$24.33) each for yearlings, and £4 (or \$19.47) each for calves. These sums include all charges.

The annexed statements give the statistics for cattle-breeding in this consular district, as far as I have been able to obtain them.

SAMUEL SPACKMAN,

Consul.

UNITED STATES CONSULATE.

Cologne, December 19, 1885.

General statistics concerning Rhine Province cattle.

Name of breed.	Annual average production of milk.	Milk to 1 pound of butter.		Name of country.	Size at maturity.			Live weight.		
					Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
	Pounds.	Liters.*	Liters.*		Feet	Feet	Feet.	Lbs.	Lbs.	Lbs.
Birkenfelder	9,700	16	8	Birkenfeld	4½	4½	4½	1,300	2,400	2,400
Westerwälder	7,600 to 8,250	16	8	Westerwald	3½	4½	4½	1,200	1,800	1,800
Eifel	7,700 to 8,250	16 to 17	8	Eifel	4½	4½	4½	1,400	2,000	2,000

* A liter is .2200667 of a gallon.

Topography.

Name of country.	Altitude.	Mean temperature.	Summer.	Winter.
	Feet.	° F.	° F.	° F.
Birkenfeld	960 to 1,650	44 to 47	61 to 63	30 to 36
Westerwald	960 to 2,300	44 to 47	61 to 63	26 to 36
Eifel	960 to 2,300	44 to 51	61 to 66	26 to 35

Name of country.	Soil.	Substratum.	Cultivated grasses.
Birkenfeld	Chalky	Slate	Fine grass in cultivated districts, and in many parts of the country fine lucern clover.
Westerwald	Basalt	Basalt	Fine grass and common clover.
Eifel	Volcanic tufa, basalt, and trachyte, and in some parts of the Eifel trias formation.	Volcanic tufa, &c.	Short grass and white clover.

DESCRIPTION, ETC.

Birkenfelder: This breed is of reddish-yellow (more red than yellow) color; the cow is about 4 feet 6 inches high and very long in proportion to height; the dewlap is very large, horns of ordinary size; they arrive at maturity in four years, or after changing teeth. The product is 4,800 liters of milk or 600 pounds of cheese; meat, 1,025 pounds for cow and 1,250 pounds for ox (dead weight). For the first four or five weeks calves receive milk direct from the cows; afterwards they are fed upon a mixture of ordinary milk and linseed cake. Animals are only housed during the severest winter weather, and then placed in ordinary stables. In winter the animals are fed upon white turnips, bran, refuse from distilleries, oil and linseed cake, and in summer upon grass and hay.

Westerwälder: This breed is fawn color, with white faces or head, very large neck and dewlap, and very long in proportion to height; the horns are not very long and stand upright. Age at maturity the same as Birkenfeld. The product is 3,700 to 4,000 liters of milk or 460 to 500 pounds of cheese; meat, 650 pounds for cow and 950 pounds for ox. Directly after their birth calves are taken from the cows and fed with good milk for the first month, and afterwards with a mixture of sour milk and buttermilk; if this should prove too much of a laxative the sour milk is mixed with a paste made of linseed powder and warm water. The animals are housed most of the year, but are turned out in the fields after the grass is cut. The feed is bran, sweet turnips, and beets.

Eifel.—Dark brown color, with white spots, ordinary form, the neck and dewlap not being so large as the Birkenfeld. Age at maturity same as above. The product is 3,800 to 4,000 liters of milk or 475 to 500 pounds of cheese; meat, 750 pounds for cow and 1,050 pounds for ox. The calves of this breed are treated and fed in the same manner as the Westerwälder. The animals are kept in ordinary stables during the severest winter weather; their food consisting of turnips, refuse from distilleries, &c.

The principal markets for the sale of butter and cheese are in Cologne, Coblenze, and Mayence, where they are sent by boat or rail.

DENMARK.

DANISH CATTLE.

REPORT BY CONSUL RYDER, OF COPENHAGEN.

I have herewith the honor to inclose, duly filled out, the form annexed to the circular from the Department under date of 18th July last, with reference to cattle-breeding, and at the same time have the honor to present the following observations relating to this matter:

Denmark possesses two breeds of cattle, namely, the Red Danish and the Black Spotted Jutland. The first named constitute the cattle herds of the islands, as also of those of a few districts in the southern part of Jutland, whilst the Black Spotted are to be found throughout all the Jutland districts. Side by side with these two breeds are to be found, in a few districts, more especially in Jutland, some of the Shorthorn cattle.

THE RED DANISH CATTLE.

This is one of the most noted milking breeds in existence. This breed has been formed by improving on the well known-Angeln breed from Schleswig, which, with more abundant foddering and care, has in Denmark been brought to greater size and with larger development in milking qualities.

The Red Danish breed, when full grown and in good milking condition, has a weight of from 900 to 1,050 pounds and as a rule their first calving season takes place at the age of two and one-fourth to two and one-half years. After the first, and in part after the second calving periods, they do not give their full yield of milk, but neither do they require such generous foddering. There are large numbers of these cows which give an annual yield of 8,000 pounds of milk; and it is not infrequent amongst the best cattle herds to find cows giving 10,000 pounds of milk in the course of a year. In the bountiful-fed herds it is frequently a matter of difficulty to keep the cow dry some time before calving. In order, however, to spare and strengthen the animal, every method is employed to run her dry for the space of six to eight weeks.

In the inclosed form of the cattle circular, it will be observed that the average annual milk yield is put down at 6,500 pounds; but this is to be understood as being the average twelve months' yield during the cow's entire life period; so that its yield whilst a young cow is also included therein.

The Red Danish cattle are almost entirely used as dairy herds, and, while in good milking condition the cow remains thin. Not only does she convert all her food into milk, but appears also to perform the same operation with the fat and muscles of her body; but so soon as she falls off in her milking qualities and begins to run dry she fattens easily.

BLACK SPOTTED JUTLAND BREED.

These cattle are about the same size as the Danish red breed, although of somewhat heavier build, and with bodies of slightly greater breadth and depth.

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The Jutland breed of cattle are used both for dairy and meat purposes, and are exported annually in large numbers in a fattened condition from Jutland to the English markets. The midland, northern, and more especially the western districts of Jutland have from early times been noted for the superiority of their breeds and a large number of heifers and young cows are every year bought up in these districts for removal to other parts of the Kingdom.

During the last fifteen to twenty years the Jutland breed has been greatly improved, both in regard to milking qualities and in its earlier maturity.

The average quantity of its milk yield as given in the inclosed circular form, is attained by all good cows of the Jutland breed, and this amount is exceeded by not a few of them. At the same time this breed is of such thriving character that the bullocks can attain a weight of 1,000, to 1,100 pounds at the age of one and one-half years, and a weight of 1,300 to 1,400 pounds at the age of two and one-half years.

The object constantly kept in view in Jutland is the development of milking qualities, whilst retaining at the same time a broad, deep, and well built body.

NUMBER OF CATTLE IN DENMARK.

In the year 1881 there were in the Danish islands 586,497 head of cattle; in Jutland, 883,581—total in Denmark, 1,470,078.

EXPORTS OF DANISH CATTLE.

The export of cattle from October 1, 1881, to September 30, 1882 was 99,759 head, with an average export for the decennium from October 1, 1871, to September 30, 1881, of 84,550 head.

Of these exports about 60,000 head, annually are sent to the English markets in fattened condition, and about 30,000 to Germany as lean cattle.

DANISH CATTLE FOR THE UNITED STATES.

Parties desirous of introducing Danish cattle into the United States as breeding stock will meet with no difficulties in the way of transportation, as there has for some years been in existence a regular line of Danish steamers running between Copenhagen and New York, carrying emigrants and cargo at about the current going rates of freight from the English ports.

The cost of the Danish cattle will also be considerably less than for the English Shorthorn, Ayrshire, and Durham breeds.

HENRY B. RYDER,
Consul.

UNITED STATES CONSULATE,
Copenhagen, December 31, 1883.

Special statistics concerning cattle in Denmark.

	Red Danish cattle.	Jutland cattle.
	Pounds.	Pounds.
Annual average production of milk	6,500	6,800
Milk to 1 pound of butter	28	20
Live weight:		
Cow	900 to 1,450	900 to 1,100
Bull	1,200 to 1,400	1,400
Os		1,200 to 1,400

Red Danish cattle: Color, red; product, milk, butter, and skim cheese. They have been bred pure in Denmark for thirty to forty years. Origin of breed, Angel Schleswig.

Jutland cattle: Color, black; age at maturity, three to three and a half years; weight, 800 to 900 pounds; products same as Red Danish. The origin of breed is Jutland; they have always been bred pure.

The cattle are housed in cow-sheds from October 1 to the middle of May. The cows and heifers are tied into the stalls. The feed for a cow in milk is 8 to 10 pounds of corn and like, 8 to 10 pounds of hay, straw and some roots (about 20 to 40 pounds of roots). Heifers are put to the bull at fifteen to eighteen months old. The butter, milk and whey are used for feeding pigs.

Topography, &c.: Altitude, slight; mean temperature, 74° C.; summer, 15.4° C., winter, 0.5° C. Soil, clay; the subsoil consists of a marly clay, of glacial origin, contains large boulders, and known as "boulder clay." Timothy, clover, ryegrass, &c., are cultivated.

THE ANGELN CATTLE OF DENMARK.

REPORT BY CONSUL RYDER, OF COPENHAGEN.

I have the honor to transmit a report on cattle of the Angeln breed in Denmark.

A woody landscape, with comparatively small fields, surrounded by sheltering live hedges; a fertile, genial soil, with good grass growth, and cattle, which, from remote times, have always been raised for their milking qualities, with a full ignoring of meat production, and, in former times, with a contracted breeding increase, as also a sparse winter foddering, and finally, a certain care taken by the population in watching over the good descent of the cows on the mothers' side—these are the chief points from the influences of which the Angeln breed has been formed.

There may have been other causes of which I am ignorant; for example, special qualities of soil and grass, which might have influenced this interweaving; but to allow that the Angeln breed springs from doubtful crossings in remoter times, that the breed sprung from English cattle which one of England's kings had presented to his sister, the dowager duchess of Holstein, is not needed to show their peculiar qualities. A close observation will show that the same causes which in these days keep up the Angeln breed can be accepted as having been sufficiently potent in course of time to form the breed.

As the most prominent features of the better class of animals may be mentioned a fine, and, considered as milking cows, a regular construction of bone, to which may be added a somewhat small and delicate head (with long lower jaw), also fine, white, slightly up-curved horns, a lean and rather angular body, thin, fine neck, a fine and, frequently, loose, smooth skin, and finally well-developed milk organs, and, as a rule, large hind quarters. The Angeln cow, as compared with the island cattle of this country, may be considered as under the average size.

According to reports the weight of a four-year-old bull or five-year-cow averages 750 to 800 pounds, which may, however, be considered as somewhat high.

These well-known features of structure in the Angeln cows are in such close connection with the general life-conditions of the race that in all chief respects they easily allow of being guided thereby.

Owing to the great stress laid on the milking properties of the cow, and to the fact that the offspring are either sold at a young age for breeding purposes or as lean cows for grazing, for the promotion of the milking qualities, the cattle movement for the meat production as

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a general trade has not exercised any important influence on the development of the race, as has been the case in Jutland. The effect of this tendency to form families and races, which is very general in Angeland, must not be estimated too lightly, for it has been the means of keeping the good stock together. In the Angeln breeding the greatest importance is attached to the cow and the least to the bull. The bull here is always young, but this has both its weak as well as its strong sides in land husbandry.

The cattle interests in Angeland have thus in full measure reaped the benefit from the breed, having stood ready and fully developed when the demand of the present day for improvement began to make itself felt, as the neighboring countries, to a large extent, have sought it for breeding. It is only the Dutch cattle which in that respect offer opposition to the Angeln breed.

When the Angeln breed was first introduced into the country can scarcely be stated with any certainty. The oldest known herds date from thirty to forty years back, but it is possible that the importation took place earlier than that in the island of Fyen, which was at that time the highway for cattle from South Jutland to the islands and to Copenhagen.

Even if the chief part of the cattle which came that way were from North Schleswig and Ballum, still it may be supposed that some Angeln cattle may have followed the stream. This importation has gradually become very considerable.

Although there have naturally occurred several crossings with the allied groups of cattle in the islands, still it comes probably nearer the truth if one considers the extension of the Angeln breed to be due more to the introduction of the cattle on the spot than to crossing therewith.

The cattle census of this country shows very plainly what part the Angeln cattle play, not only in the islands, but in Jutland.

On taking the census there were ascertained to be of Angeln bulls and bulls of native breed as follows:

Districts.		Angeln.	Native races.
1866.			
In the islands		1,981	10,894
In Jutland		266	4,833
1871.			
In the islands		1,961	7,907
In Jutland		266	4,298
1876.			
In the islands		2,380	7,091
In Jutland		300	4,376

From 1871 the breed of Angeln cattle makes rapid progress, whilst the foddering at the same time becomes more plentiful, and the requirements for a larger milk yield is awakened.

On the islands the Angeln bulls have increased in the last five years 21 per cent. and in Jutland 13 per cent. With this increase it cannot be doubted but that the race has been introduced into unadaptable districts. Accustomed to sheltered fields in its native home, and delicate of structure, it naturally calls for attention and care in its treatment. But it has also been shown that it can thrive well and increase its milking powers, even in a severe climate, when it receives a continued liberal and regular course of feeding the whole year round.

When one is unable to bestow such nourishment on the Angeln cattle, it would be advisable not to keep them, because, just as they are able to make a return for their liberal keep, they are liable to recede where the soil, climate, and natural conditions are unfavorable. Not only do they fall off in their milking qualities, but they sink under attacks of consumption.

When the breed of Angeln cattle began to be cultivated in this country strong, nourishing fodder was far from being common, and even on the larger estates much less fodder was given than in later times.

The ruling principles in breeding were to preserve and to further develop the fineness in the breed, and mainly from a scanty feeding and from the early stage of calving of the young cows this fineness was at times carried to a dangerous extent. Gradually, however, a reaction took place in this respect, and subsequent to the agricultural meeting in Copenhagen in 1869, there commenced a demand for greater body development, whilst at the same time a more liberal foddering became general. But it was also shown that the Angeln cattle did not disown their natural thriving tendencies, for the breed by degrees willingly submitted to the new requirements demanded of them, and even in such herds, where most advancement had been made in the direction of fineness, but where, however, health had been preserved, good results could be obtained.

These movements in breeding Angeln cows, and the results therefrom in later times, are contrary to the belief that when the necessary fineness has been reached in any productive breed and becomes a sign of race or descent, that then a very considerable structural development, both as regards body and bone surface, and therewith a corresponding life existence, may be given to the animal without any sensible loss therefrom in fineness, whilst the producing properties are increased at the same time.

Sufficient attention has not always been given to these points, and those who have either received their views of the Angeln breed from the period when the general desire was for elegance, or from those herds of the present day, where they pertinaciously hold to the same, and who have scarcely paid attention to the movements of the last ten years in the advanced herds of the country, can yet be astonished at what they have noticed in the fineness and so-called one-sided consequences in dairy thrift. In those parts of this country, where one only in the later years has begun to understand what dairy thrift really means, it has been very hard for them to get rid of the scare which the remembrance of by-gone days associated with the ideal of a good milch cow.

The above mentioned experience in regard to the development of the fine Angeln breed in the last ten years will, however, without any doubt, soon help to dissipate this scare once for all. Even if it be taken for granted that the Angeln cattle in their native home have, as before stated, a weight of 750 to 800 pounds each, which calculation is from 1877, and thus included the progress, small as it is, which the breed has made even in its native home, still this weight is probably not a little above what the fine Angeln cattle weighed from the year 1860. But even if one goes out from 750 to 800 pounds for a five-year-old cow a considerable increase in weight can be seen in the Angeln cattle now in this country.

For the year 1881 the following weights have been given of Angeln cows on a Danish farm, namely, 17 head of cows, 6 five years old, that had calved weighed 912 pounds per head; 14 head of cows, seven 4 years old, that had not calved, weighed 1,058 pounds per head; three-year-old

heifers weighed 820 pounds per head; two-year-old heifers 798 pounds per head.

Gabel places the milk yield of an Angeln cow of 750 to 800 pounds at 2,300 to 2,500 liters of milk. This milk yield was obtained with the following daily fodder: 8 to 10 pounds hay; 3 pounds wheat bran; 2 pounds peas; 2 pounds oats; 1 pound bruised meal; 10 pounds butts, or else 8 to 10 pounds hay; 5 pounds barley; 3 pounds oats; 2 pounds wheat bran and straw.

It is not stated what the above-mentioned 17 cows that had calved yielded of milk in the year, but it is pretty certain that any 17 head of six-year-old cattle of the farm's herd will yield much more during the year, and which would be equivalent to 6.2 times their weight of body.

If the average weight is taken of one to two year and of two to three year old heifers, together with that of the 17 cows, which probably will not be far from agreeing with the proportions between the older cows and the heifers on the farm, an average weight of 838 pounds will be obtained, and which for an average milk product in the year for the whole herd of 6,100 pounds will give a proportion of about 1:7.2.

Thus there is not only a considerable increase in weight of body but also in absolute and relative yield of milk. Even supposing that the herd on this farm is somewhat superior to those on others, it still does not weaken what has been maintained, as most surely the greatest part of the Angeln herds in this country will be able to show a similar, even though it be a somewhat smaller progress.

HENRY B. RYDER,

Consul.

CONSULATE OF THE UNITED STATES,
Copenhagen April 20, 1882.

BUTTER EXPORT OF DENMARK.

REPORT BY CONSUL RYDER, OF COPENHAGEN.

I have the honor to present a report on the butter exports from this Kingdom to Great Britain, together with the relative position taken by this country under this head as compared with the other important exporting lands.

The steady and extensive progress which has been maintained by this country in this important branch of dairy produce during the last eighteen years is of very striking character, and is brought prominently to light in the following statistical returns, showing the quantities and estimated value in round numbers of the exports in the past years:

Exports of Danish butter from 1866 to 1883.

Year.	Quantity.	Value.	Year.	Quantity.	Value.
	<i>Cwts.</i>			<i>Cwts.</i>	
1866.....	67,305	\$1,526,000	1875.....	206,171	\$6,200,000
1867.....	80,580	2,033,000	1876.....	205,165	6,372,000
1868.....	79,437	2,290,000	1877.....	216,322	6,550,000
1869.....	163,613	2,794,000	1878.....	242,427	7,375,000
1870.....	127,013	3,628,000	1879.....	281,740	8,133,000
1871.....	140,857	3,964,000	1880.....	300,157	8,637,000
1872.....	173,574	4,905,000	1881.....	279,625	8,222,000
1873.....	201,558	5,849,000	1882.....	304,732	8,004,000
1874.....	220,653	6,618,000	1883.....	353,584	10,457,000

In connection with this movement it is of interest to take note of the information conveyed through English statistical returns of the butter imports into that Kingdom during the same period from the chief butter-exporting lands, viz, the United States, Belgium, France, and Holland.

It will be sufficient here to give these import returns for the year 1883, which were of the following nature, viz:

From—	Quantity.	Value.
United States.....	<i>Cwts.</i> 120,163	\$2,733,000
Belgium.....	59,638	1,275,000
France.....	563,219	12,683,000
Holland.....	988,266	20,453,000

Upon critical investigation, however, of the returns for previous years, it is seen that the butter exports from the United States have been subjected to considerable fluctuations; that whilst these exports in 1869 only amounted 17,203 cwts., they had in 1876 reached up to 118,131 cwts., continuing still on the increase for some years, when in 1879 they had attained their maximum point of 301,054 cwts. From that date they have apparently been on the decline until in 1882 they are only seen to amount to 51,246 cwts., again rising, however, in 1883, to 120,163 cwts. The imports from Belgium are likewise seen to have been retrograding. They would appear to have reached their highest stage at the close of the sixth decade to the commencement of the seventh, when, in 1871, the imports from that country are credited with 94,539 cwts. All the subsequent years show a gradual decline, and at the present day they figure for little more than one-half of the amount attained in 1871.

The butter exports from France to Great Britain have, on the other hand, been maintained without any perceptible changes, whilst the exports from Holland are found to have met with a very considerable increase; but this rapid increase is more apparent than real. It is without doubt in great measure due to the very large production and export from that country in the latter years of spurious butter, and which in the English returns are not classed under a distinct rubric, but are indiscriminately mixed up with real butter; thus, whilst the exports from Holland in 1872 were only 269,091 cwts., in the year 1883 they figure for the large amount of 988,266 cwts. As before mentioned this great increase is chiefly made up by the heavy exports of butterine, &c.

In instituting a comparison between the exports from Denmark for the year 1883, with those from the other previously mentioned lands, it will be seen that the exports from this Kingdom are nearly three times as large as the exports from the United States, nearly seven times as large as those from Belgium, and are only inferior to those from France and Holland.

It is at the same time of interest to examine the estimated values which are placed upon the butter from the different countries in the English statistical tables, these valuations in the returns for the year 1883 being denoted as follows, viz:

	Per cwt.
Danish butter.....	\$29 50
French butter.....	25 00
Belgian butter.....	25 00
United States butter.....	22 50
Dutch butter.....	20 00

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The Danish butter thus being placed at the head of the list as regards value and at considerably higher rate than its competitors, next coming France and Belgium, thereafter the United States, and last of all Holland; the low values for this country being again influenced as before remarked, by the large amount of spurious butter included in the returns. The total estimated value of these butter exports from the above-mentioned five countries in 1883 closely approached \$48,000,000.

Whilst passing these figures under review it must not, however, be forgotten that the estimated values of these tables are based upon the aggregate imports from each country, and that it chiefly tends to show that the high position held by this Kingdom is mainly owing to her exports consisting on the whole of a high standard class of butter; whilst a far greater proportion of inferior butter is included in the exports from the other countries, and it must on no account be taken for granted from these tables that Danish butter at all times commands the highest prices in the English markets, as it is a well known fact that it by no means obtains the prices paid for the fresh, sweet, unsalted classes of English and French butter.

From France the imports may be said to consist of two kinds. The one coming from the northern part of that country is sweet and unsalted and made up in pieces of 2 to 3 pounds weight, packed in small boxes of willow bark, whereas the other sorts are from the collected purchases from the smaller land-owners throughout the country, but salted and packed in ordinary buttercasks. This sweet, unsalted butter of England and France can at all times command in the English markets the higher price of 4 to 6 cents per pound above that of the very finest quality of Danish butter.

In the latter case a small quantity of this sweet, unsalted butter, packed in the same way as the French article, has likewise been exported from this country; but the long sea route and the present restricted steam intercourse with the English ports, have prevented any great development in the manufacture thereof, whilst the French producers, being on the other hand favored by a short sea route and almost daily steam communications, are enabled to secure the full advantages of these extreme prices. The sweet, unsalted description of butter is almost exclusively directed to the great London market, whereas in the great Manchester market and other large northern towns in England, Danish, French (salted), Dutch, and American butter is chiefly to be met with.

Without question the sweet, unsalted butter must be considered as the finest and most remunerative description for export, and which the producers in the northern parts of France are fully alive to. Here it is equally felt that more satisfactory results could be obtained for the Danish butter if it could only be exported with all safety in the sweet, unsalted state, but, unfortunately, it is too liable to injury during the lengthened period of transport under the present restricted means of steam communication between the two countries. The great importance of a more rapid and more frequent intercourse with the great London market is now so keenly felt here by the agricultural classes that petitions have been sent in from all the agricultural societies to the home ministry for subsidies in aid of proposed line of steamers to run from the port of Esbjerg, on the west coast of Jutland, with a biweekly service. It is calculated that a sea voyage from that port to London may be accomplished on ordinary occasions within thirty hours, and that, with an appropriate regulation of the time tables for the different railways in connection with Esbjerg, that the entire transport can be made in such short space of time as to allow this description of unsalted but-

ter to be brought on the London market in perfectly sound condition; and it is now earnestly hoped by the agricultural community that the so long desired step in furtherance of a fuller development of this important branch of their interests may in the very near future be carried out in one way or another with successful results.

HENRY B. RYDER,
Consul,

UNITED STATES CONSULATE,
Copenhagen, September 29, 1885.

UNION DAIRIES IN DENMARK.

REPORT BY CONSUL RYDER, OF COPENHAGEN.

I have herewith the honor to present a report on a subject which is being much discussed in agricultural circles here, as to the advantages or otherwise derived by the class of small landed proprietors, in connection with their relations to the present extensively developed system of union dairies.

It is now taken for granted that butter produce, in so far as it may be intended for exports, must be packed in casks of a net weight of 75 to 100 pounds, and that it is useless to maintain that the butter is equally as good whether it is sold in half firkins or in packages of larger size, for the simple reason that so long as English customers demand the larger packing, so long it will be necessary to comply with their wishes. The small producers thus find themselves unable to complete the delivery of their butter in such large packages without incurring the risk of finding the lower contents losing its freshness before the packing can be completed, and are compelled to choose between two modes of procedure viz, either they must dispose of their milk to the union dairies, which collect their supplies from many small producers, working the same under one system and producing butter therewith on a large scale, by which means butter can be packed and brought into the trade exactly in the same way as from the large estates, or it is left to these small producers to pack their own butter, selling it in small jars to the neighboring dealer, who purchases butter in these small packages for the purpose of repacking after careful sorting into casks of the required size, and then bringing them into the trade for export.

This last method, in order to meet with successful results, demands that the butter production amongst the small farmers shall have attained such development as to admit of a sufficient supply of good and uniform character being obtainable, so that the dealer, with careful selection, will be enabled to offer this jar butter when repacked in casks, in the same good uniform condition as butter of first class quality from the large estates.

The Union Dairies, in the beginning of their career, had many difficulties to contend with in their attempts to produce butter of good quality; but with the introduction and great development of the centrifuge system, these obstacles may now be said to be removed, inasmuch as the centrifuge can thoroughly separate the cream from the milk in a short time, even in such instances as where the milk may have lost much of its freshness from the longer period which may have elapsed during the lengthened stage of its transport to the dairy. Owing to this improved system of working the milk, the Union Dairies have largely developed during the last four years in all parts of the Kingdom, and such sanguine expectations are entertained of their operations

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Consul.

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being crowned with complete success that a still further development is promoted by the great feeling of sympathy in their favor.

That these dairies obtain a large amount of butter from their milk, and that they are in a position to bring this butter direct to the markets and there obtain equally as high prices as for the best butter from the large estates, seems to be the general opinion amongst the small landed proprietors, and that they can obtain better returns for their milk through the medium of these dairies than by any other course of procedure.

The home production of butter amongst the small proprietors is looked upon by them as a hopeless contest against such conditions, partly from the difficulty in producing a first-class quality of butter with their limited supply of milk, and partly from their inability to dispose of their butter at full prices as corresponding with its quality.

Many are of the opinion that much illusion exists with regard to these dairies. These Union Dairies, they urge, have to carry on their operations under very great difficulties, and this is especially the case in the thinly-populated districts of Jutland, where the milk has to be collected from the widely-spread farms over a large area.

These difficulties with which the Union Dairies have to contend, they maintain, are too much underrated by the public, just as much as the difficulties attending home production are overestimated, and it thus remains an open question how far this feverish hurry which has been displayed in the erection of so many new Union Dairies, year after year, before actual necessity has allowed sufficient time for ample tests of experience, is really matter of congratulation for the interests of Denmark's important branch of dairy drift.

Few proprietors of large dairies will be ready to admit that it is so easy a matter to produce butter of the finest quality, and at the same time always to obtain the highest prices of the first-class article. On the contrary, they are too often accustomed to receive complaints from their customers over the slightest falling off in the fineness of their butter, and that it is only with the aid of a good dairy staff and by constantly being on the alert that these complaints can be prevented and all errors redressed. The attention of these large dairy proprietors is continually directed towards the proper feeding of the cows and carefully watching that the fodder mixtures are good and appropriate; that the milk from such cows as are not in a normal condition is carefully set aside for separate treatment lest it should be injurious to the other milk, or even a doubt be entertained thereof. After dwelling on this phase of the subject the question must naturally arise, in what way do the Union Dairies, which receive the milk from fifty or sixty different places without having any knowledge or control over the cows' foddering or their general condition, contrive to carry on their operations successfully? Furthermore, whilst the large dairy owners have always considered as a main point for the production of fine butter that the milk should be conveyed as quickly as possible after milking to the dairy for cooling, and whilst it has always been regarded of absolute necessity that the milk should be removed from the stables at least twice during the milking, so that it may at once be strained and cooled before losing any of its freshness, or injured by any acid formation or from the action of warm and impure air—how, then, it is asked, do the Union Dairies manage to counteract these evils with the evening's milk, which has been allowed to lay over night at the supplying farm, from which it is brought together with the next morning's milk? They thus strongly question if butter of first quality can be produced under these circumstances.

In support of these views it is stated that at the exhibition lately held here over dairy products, out of fourteen exhibits sent in from the Union Dairies, the position of first-class butter was not awarded to them in any single case, and it must not be supposed that this was due to want of proper management in the dairies, as it is fully acknowledged that these are conducted with a very able staff of managers and assistants, but must rather be attributed to the difficulties which they have to contend with, which the ablest of dairy farmers is unable to overcome entirely. With the Union Dairies it is not simply a question of slight errors, but rather an unfavorable character throughout, which in part is displayed in the shape of an unpleasant taste and an unsatisfactory quality, with such peculiar outer appearance that it does not bear the least resemblance to the finest quality of butter from manorial estates.

This pervading unpleasant taste and peculiar outer character, which are characteristics of the butter from the Union Dairies, leaves no doubt but that the same defects and difficulties are common to all of them.

For the production of fine butter good and properly treated milk is first of all the main requisite. Whether the milk used in these dairies possesses these requirements it is difficult to say, and perhaps the managers themselves are not certain on that score, as, practically speaking, it is received by them without the least control or knowledge of its nature. But if these dairies are not supported in this respect by the furnishers in the most conscientious manner, then the discontinuance of their work will undoubtedly only be a question of time. In brisk times of trade, it would appear that difficulty is often found by them in disposing of their produce as first-class quality, and that the prices obtained vary between those of first and second class, and that in dull seasons the sales are attended with considerable difficulty; and as before stated in same degree as these difficulties have been underrated, so have the difficulties attending the home production been overestimated.

It is maintained that no difficulty need exist for the production of fine butter by the small proprietors, as no later than some six or seven years back the produce of these small owners stood at such a high standard that they could display a large exhibition of butter in jars and half firkins, to which nearly half of the exhibits were awarded prizes.

The want of Union Dairies was not then felt, and it is doubtful if at that time these small producers would have been satisfied with the prices they now receive for their milk from the union dairies. In those days there existed in all the towns a numerous class of butter-packing dealers, who purchased this jar butter for subsequent sorting and repacking. With the introduction of the Union Dairies these dealers have all nearly disappeared, for the simple reason that too small a quantity of faultless butter from these small farmers is now brought to hand to admit of any similar repacking with advantageous results. Complaints were frequent, however, on the part of the small producers that when they did supply these dealers with butter in jars of best standard quality, and which was subsequently resold by these dealers at the prices of first-class butter, that they nevertheless had only received at their hands the price of second class; and that they could not be satisfied that the dealer should thus be reaping an advantage of $2\frac{1}{2}$ to 3 cents on every pound of butter, simply because it was delivered in jars.

The producer should, however, bear in mind that where he disposed of his butter in jars at the price of second class that he was obtaining a net price therefor, whilst the dealer who again resold to the trade at first-class prices had to submit to several drawbacks and charges, such

as shrinkage, estimated at more than 10%.

The result to advise the Union Dairies to require, and statements fully admitted, very able in their production in any way, and in the markets; which these be lost or in the opinion of the producers should be taken place, opinion that in the form of butter, and will again does not exist, more steady, great weight for their prices, and real foundation to obtain the it at the prices so to as the Union Dairies.

Of this, however, these small so advantage in their relation of their and supervising as by proper at all times sound condition active support need not receive milk and on no great length their works such case it producers find home production as to be free the required.

as shrinkage in weight, cost of transport, &c., which may fairly be estimated at 5 to 6 per cent.; so that the complaints on this score were more imaginary than real.

The results from these divergent views would appear on the one hand to advise caution on the part of the public in the too hasty erection of new Union Dairies before sufficient knowledge and experience has been acquired, and not to allow themselves to be too blindly led by prejudiced statements and calculations. It should be remembered that whilst it is fully admitted that these dairies have been under the supervision of a very able and skilled staff of managers and assistants, that nevertheless their productions so far can scarcely be said to have been instrumental in any way towards raising Danish butter to that high standard of reputation which it at present holds in the foreign, more especially the English, markets; and it need not either be feared that any advantages or good which these dairies under various conditions have been able to effect will be lost or injured by giving ample time for a proper and minute consideration of their system of operations, and at the same time the small producers should be taught that before this thorough investigation has taken place, they should not put too implicit confidence in the public opinion that these dairies are their only hope. They should remember that in former days they were fully able to furnish a high class standard of butter, and that they then went to their work with pleasure. If they will again devote the same zeal they will again realize the fact that it does not call for a much greater amount of labor to produce a good quality of butter than it does to make an inferior article; it only requires more steady attention and judgment. They must not either place too great weight on the general complaint that they do not obtain full value for their produce when they are forced to sell first-class butter in jars for prices paid for a second-class article, as that complaint is without any real foundation. It is hardly to be imagined that the producer who can obtain the needful assurance of making good butter, and can dispose of it at the price of second-class quality, will not find it more to his interests so to act, rather than to content himself with the sale of his milk to the Union Dairies.

Of this, however, every one must be left to judge for himself; but if these small proprietors remain of the opinion that the Union Dairies are so advantageous to them, then at least there must be such earnestness in their relations to each other that by careful attention to the foddering of their cows and by treating them in every way with the same care and supervision as if they themselves intended to use the milk, as well as by proper attention to speedy straining and cooling, so that they will at all times be in a position to deliver their milk supplies in perfectly sound condition. If the Union Dairies cannot place full reliance on such active support from the producers, their position will be hopeless, as it need not require a prophet to foretell that when they pay 1 cent for the milk and only get back three-fourths of a cent in the shape of butter, no great length of time must elapse before they will be forced to bring their works to a close, and all concerned will be of one mind, that in such case it will be a day of bitter disappointment when the small producers find themselves again compelled to make use of the milk for home production after having arranged their operations on such footing as to be free from the work and when they have also entirely got out of the required habit and practice.

HENRY B. RYDER,

Consul.

UNITED STATES CONSULATE,
Copenhagen, August 25, 1885.

HOLLAND.

DUTCH CATTLE.

REPORT BY CONSUL ROKSTEIN, OF AMSTERDAM.

HUNTING UP CATTLE STATISTICS IN HOLLAND.

In compliance with the instructions contained in the Department circular of the 18th of July last, and in the memoranda accompanying the same, received by me on the 4th of October, I have the honor herewith to return a series of forms such as sent with the said circular, being filled out and containing as much and as authentic information as obtainable, and further to report on the subject as follows, viz:

Observing that the matter at issue is regarded to be of great importance to the agricultural interests of the United States, and that the Department desires and expects that in investigating the same it be so exhausted as to leave as little as possible to surmise or speculation, I have to express my regrets that in performing the task assigned to me I found myself so utterly unaided by any practical experience in farming, stock-raising, and dairying, and my own knowledge of those pursuits so limited and superficial.

Realizing my shortcomings in these respects, it became the more necessary that I should make, as I did, the greater efforts to secure information, data, and material of such persons as are generally held to be amongst the best authorities on the subject in this country.

Strange as it may seem, it is nevertheless true that here in Amsterdam I could obtain no information or be in any way facilitated in the premises beyond ascertaining the names and places of residence of certain parties to whom to apply for attaining my object.

Amongst others I was directed to Mr. J. P. Amersfoord as one of the persons most widely known for possessing an intimate knowledge of and having much practical and diversified experience in affairs pertaining to farming and stock-breeding, &c.

He is the owner and proprietor of one of the finest estates in this country, and of a country-seat, named "Badhoeve," situated near the little town of Sloten, on the turnpike between Amsterdam and Haarlem, about an hour's drive from this city.

There I called upon him, explained to him the object of my visit, and received from him courteous offers of such assistance as it was possible for him to render me.

I left in his hands a copy of the forms and of the memorandum, a few of which I had previously printed, to be left with the parties whom I expected to ask for, and, if possible, receive the required information, data, or statistics for this report.

Mr. Amersfoord prepared, and, several weeks thereafter, furnished me the filled up forms herewith inclosed.

I send them just as received from him, believing that any attempt on my part to sift and transcribe the information they contain might have impaired the value thereof, and that on coming into the hands of some

person fully understanding the subject, as it doubtless will, it can be made available to better advantage.

As I could not be anyways sure, however, to what extent and at what time Mr. Amersfoord would serve me, I considered it necessary to apply in still other quarters for the indispensable data and statistics.

With this object in view I went to Wageningen, there to confer with Jongkindt Coning, esq., the director of the state agricultural school, and, also, to Beverwyk, to meet G. J. Hengeveld, esq., who for a great many years was a teacher in the Government veterinary school, at Utrecht, and who is the author of one of the best and latest published works in this country on "Cattle, its different sorts, breeds, and improvement."

Mr. Coning being seriously ill at time of my visit kindly sent for one of his assistants for me to confer with, and with him, as in the case of Mr. Amersfoord, I left copies of the forms and memoranda, after receiving his assurance that he would fill out the forms for me should he find it practicable to do so, and give me any other information that he could.

The result of my visit to Mr. Hengeveld was substantially the same.

After waiting about six weeks I received from the parties mentioned certain data and statistics. The forms, however, they did not fill out.

The assistant director of the state agricultural school, in writing to me, explains his reasons for returning the forms in blank, in substance, about as follows:

Matters relating to the live-stock interests of the Netherlands are of too vital importance to permit of answering such radical and interesting questions as are indicated or involved in or by most of the headings of the forms desired to be filled out otherwise than in the most correct way.

With the data at present on hand for this purpose it would be impossible to do this. In such manner as, with great difficulty, he could now answer those questions, he would not want to be responsible for their correctness.

He would not say, however, that it was impossible to fill up the lists so as to convey perfectly authentic and trustworthy information, but to do so would require previous investigation and research for at least two years, and cause a large expenditure.

NAMES AND DISTRIBUTION OF CATTLE BREEDS IN HOLLAND.

In now proceeding to answer the questions contained in the memorandum accompanying the cattle circular of July 18, 1883, I begin by giving a statement showing the several breeds of cattle in this country, and where located, and in giving their names confine myself to the designations given them by the assistant director of the state agricultural school, from whom I obtained my information on this point, as follows:

Groninger breed.—This breed is found principally in the province of that name, and, also, in considerable quantities in Northern and Southern Holland.

Frisian or Friesland breed.—Outside of the province of Friesland this breed of cattle exists in large numbers in the province of Drenthe, where the conditions for raising it are said to be particularly favorable.

Holland or Hollandish breed.—This breed is found in a pure state in the environs of "De Beemster" and "De Purmer," being appellations for certain districts in the province of North Holland, formerly embracing the long-since drained lakes so named. It is supposed here that the Shorthorns of England descend from this breed.

Flemish or Zealand breed.—Centuries ago this breed was extensively raised in nearly all parts of Holland, but exists now only in Zealand and on the islands of Southern Holland. The perfect type of this breed is preserved in the well known picture of "Potter."

Geldrian breed.—Most of the cattle found on alluvial soil are said to belong to this breed, but its perfect type is best preserved in the southern part of the province of Gelderland.

Drentish breed.—This breed, in a pure state, is found in the province of Overijssel. It is represented to me that best blooded well fed Drentish cows can hardly be distinguished from "Ayrshires" of Scotland.

Friesland-Drenthish-Geldrian breed.—This cross-breed is found in the provinces of Overijssel and Groninger in addition to the provinces whose names it bears.

Groninger-Friesland-Geldrian breed.—This cross-breed exists in the province of Utrecht, in Northern and Southern Holland, and on the south of the "Y," and, of course, in the provinces after which it is named. It has been extensively substituted in parts of this country where pulmonary diseases had decimated the stock, and where the introduction of, or replacement by, other and different breeds became necessary.

Flemish-Geldrian-Holland breed.—This is a cross-breed of cattle found principally, in Northern Brabant, and in Limburg.

Native and English breeds.—The only province in which cross-breeds of native and foreign (English) origin exist to any extent, is Zealand. This was formerly, also, more or less the case in Groningen, but the practice of raising this sort of stock there has been abandoned.

MISNAMING DUTCH CATTLE IN THE UNITED STATES.

In this connection it may be proper that I should allude to the fact that in the United States there prevails a practice of writing and speaking of certain or all breeds of Dutch cattle as "Holsteins." So doing seems to be very annoying to farmers, stock-raisers, and to other parties in this country, as there exists no breed of cattle and never did, as I am informed in Holland, named "Holsteins."

If notice would be taken of this matter, and the practice referred to discontinued, it would be greatly appreciated by a large number of people here.

PERCENTAGE OF THE SEVERAL BREEDS IN HOLLAND.

The following statement shows the percentage of each of the several breeds of cattle in the Netherlands, viz:

Denomination of breeds.	Percentage.	Denomination of breeds.	Percentage.
Groninger breed.....	7	Flemish-Geldrian-Holland breed.....	15.5
Friesland breed.....	18.2	Groninger-Friesland-Geldrian breed.....	23.8
Holland or Hollandish breed.....	7.1	Crossed with foreign breed, hardly to be recognized.....	2.5
Flemish or Zealand breed.....	3.8	Total.....	100
Geldrian breed.....	7.1		
Drentish breed.....	1.4		
Friesland-Drenthish-Geldrian breed.....	13.6		

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IMPROVEMENT OF BREEDS BY TRANSFERENCE TO FOREIGN HOMES.

As to foreign and imported breeds producing in their new homes offspring superior to that produced by the same breed in their original homes, and that this superiority is more marked in the succeeding than in the first generation, it is contrary to and not borne out by the experience of farmers and cattle-breeders in this country.

The possibility of such results being attainable is not gainsaid or questioned here, but it is held that to attain such results requires the existence of various and most favorable conditions, which, in certain parts of the United States or in other countries, may obtain, but they do not seem to obtain in this country, or if they do they have as yet not been discovered.

Efforts have been made, time and again, in different sections of Holland, by many of the most practical and experienced farmers and stock-breeders, to improve still further, if possible, native breeds by crossing them with best breeds brought in from England and elsewhere, and so has inbreeding of such best imported breeds been tried quite as often and by many parties in many places, but with almost the invariable result in both cases of finding in the offspring certain deterioration or degeneracy, so that inbreeding of such imported stock as a practice is abandoned, whilst experiment, from time to time, has not wholly ceased.

It must not be understood, however, and as is explained to me, that the offspring of such imported breeds showed inferiority in all particulars; on the contrary in many cases the offspring of such foreign breeds showed superiority in one or in another respect as compared with same breeds in their original homes, but, as a rule, they proved inferior in more essential particulars, and therefore the importation, breeding, and raising of such foreign cattle, no matter how fine the breed, has generally been unprofitable.

BEST DUTCH CATTLE FOR EXPORT.

With reference to the question as to "the best animals to export," I believe that in stating what Mr. Amersfoord says in relation thereto will be the best answer I can make.

He says, in substance, this:

We who, in this country, may reasonably claim to be thoroughly conversant with this matter, consider and always recommend animals one year old to be the best for export purposes; for milk breeds we recommend the North Holland and Frisian, and for both milk and beef the Groninger, which, in fact, deserves to be called the "Hereford" of Holland, and is generally conceded to be one of the noblest breeds of cattle to be met with anywhere.

PRICES OF DUTCH CATTLE.

Regarding "the purchasing prices of the animals" it is hardly practicable to speak in positive terms.

The prices paid for thoroughbred stock vary so greatly at all times and seem to be contingent upon such a variety of circumstances that it appears to be difficult to determine what really is the regular price or fixed market value at any time.

During the summer last past when cattle of this class commanded,

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generally speaking, a much higher price than in the previous year, the prices realized were about as follows, viz:

	Florins.
Calves, heifers, under one year old	125 to 150
Yearlings	225 300
Cows, from two to three years old	250 450
Cows, over three years	500 600
Bull calves, under one year old	200 350
Bulls, at from one to two years old	350 800

BEST ROUTES OF TRANSPORTATION TO THE UNITED STATES.

Regarding "the best routes of export" I have to remark that that has not been recently and is not at present a matter of choice for Americans requiring transportation for cattle from this country to the United States, as for the last few years they have been obliged to ship the stock they purchased here from ports outside of Holland, and where such freight was accepted or where transportation for cattle could be obtained—usually at Antwerp and at one or more English ports.

It is represented to me, and I am more than disposed to believe, that the best routes for shipping cattle from this country to ours are or would be from the ports of Amsterdam and Rotterdam.

But as the steamers plying between these and American ports are all carrying passengers, and are, therefore, prohibited from taking cattle on board, and as hitherto the cattle exports to the United States have been too unimportant and irregular to induce any steamship company here to make special arrangements for the cattle traffic or carriage, there exists now no opportunity to ship cattle from either of those ports.

COST OF TRANSPORTATION TO THE UNITED STATES.

As to "the cost of exportation and the estimated expenses for attendance and food *en route*," I would offer the following observations:

The cattle of this country found to be best adapted and most desirable for breeding purposes and the improvement of the stock in the United States should be, and usually are, procured in the provinces of Groningen, Friesland, and North Holland.

When bought in Friesland and Groningen it should be on condition of being delivered, by the different farmers of whom obtained, at a given time at the nearest railroad station or at the most convenient and nearest point or place for conveyance by water to Amsterdam or Rotterdam.

The cost of such transportation naturally differs very much and cannot be exactly stated. It is in accordance with or as the number of cattle at any time to be shipped is large or small, and the distance longer or shorter, but it does not amount to very much at any time per head of cattle in cases of large shipments being made.

Cattle purchased in North Holland can conveniently be, and generally are, driven from the farms to Amsterdam or Rotterdam.

The cost of transportation from this port or from Rotterdam to Gravesend, England, is, as near as I can ascertain, about £1 per head for steers, cows, and heifers, and 10s per head for calves.

The present freight rates for shipping cattle in considerable numbers

* Florins = 40.2 cents.

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from Gravesend to New York are as follows, exclusive of charges for attendance and food *en route*:

	Per head.
Full grown cattle	£6
Yearlings	5
Calves	4

The expense for attendance on cattle *en route* is ordinarily not very much, especially in cases of large shipments, as three or four persons are said to be sufficient to take proper care of a hundred or more head of cattle.

Besides, it would appear that suitable parties, farmers, or farmers' sons can almost always be found amongst intending emigrants who for a reasonable, small sum of money are willing and pleased to undertake the attendance and care of the cattle, and who in such cases have no passage money to pay, that being included in the freight-charge for the stock.

Food, hay, and straw is usually provided by the owner or shipper of the cattle; the cost varies and cannot be stated precisely, but no extra charge is made for carrying such supplies.

When cattle are shipped via the port of Antwerp they are, as a rule, taken there by rail from Amsterdam or Rotterdam.

The railway freight rates are at present as follows, viz:

Description.	From Amsterdam.	From Rotterdam.
Two oxen, cows, or heifers.....	<i>Frances.</i> 21.57	<i>Frances.</i> 14.88
One to five calves.....	21.57	14.88
Six oxen, cows, or heifers.....	32.38	22.53
Ten calves.....	32.38	22.53

In chartering a whole car, and if not more than 16 full-grown animals and 20 calves are put in, the charge is 43.14 francs from Amsterdam and 29.76 francs from Rotterdam.

If a larger number of cattle are taken in a car, as is at the option of the shipper, the price for a car is then raised 25 per cent.

The present regular ocean freight rates for shipping cattle from Antwerp to New York or Boston are, as I am informed by Antwerp ship-brokers and agents, as follows (inclusive of food and water):

Cow.....	£8
Yearling.....	7
Calf.....	6

Attendance *en route* 4s. per head.

In shipments of 100 to 200 head at a time better arrangements, they say, can be made.

CATTLE CENSUS OF HOLLAND.

The following tabular statements show the total number of cattle, classified under the separate heads of bulls, milch-cows, calves and heifers, beef cattle, and working oxen, in the different provinces and in the Netherlands from 1866 to 1870; from 1871 to 1880, and in 1881 and 1882, viz:

Years.	Groningen.	Friesland.	Drenthe.	Overysel.	Gelderland.	Utrecht.	North Holland.	South Holland.	Zeeland.	North Brabant.	Limburg.	Total.
Bulls.												
1866 to 1870	1,753	3,120	332	1,467	1,695	969	1,218	2,408	429	610	356	14,065
1871 to 1880	1,795	3,258	368	1,672	1,434	1,679	1,494	3,035	786	836	607	16,324
1881	1,787	3,083	472	1,702	2,074	1,313	1,538	2,658	975	869	634	17,182
1882	1,690	3,142	475	1,711	1,728	1,100	1,445	2,504	973	873	638	16,275
Milch-cows.												
1866 to 1870	57,194	148,095	39,507	80,069	92,270	54,854	108,647	136,657	27,470	103,014	47,018	805,974
1871 to 1880	51,187	140,255	40,007	83,442	96,342	60,901	109,482	146,564	27,149	102,359	47,463	911,241
1881	43,007	136,798	39,002	81,096	94,920	60,090	110,766	145,139	26,024	99,800	47,663	884,914
1882	42,097	133,647	39,507	81,655	91,882	60,472	111,498	145,050	26,333	99,533	47,282	878,956
Calves and heifers.												
1866 to 1870	33,655	48,497	22,692	33,537	64,457	17,116	26,956	23,179	22,715	58,258	18,054	389,623
1871 to 1880	37,232	54,905	24,877	36,900	71,790	21,170	30,976	49,122	25,939	61,333	20,165	434,623
1881	40,541	60,942	24,312	38,052	72,165	22,622	31,725	54,448	27,671	63,019	20,270	456,567
1882	39,936	62,641	25,077	39,636	73,026	22,965	32,259	52,522	27,300	61,755	20,100	457,104
Beef cattle.												
1866 to 1870	7,046	4,787	756	2,823	11,837	866	3,639	11,470	3,305	9,668	1,063	57,210
1871 to 1880	7,571	4,075	1,173	3,024	13,226	974	4,744	12,641	4,584	9,529	1,055	63,476
1881	8,069	4,659	1,325	2,887	13,121	1,633	4,971	12,887	4,934	10,323	1,813	66,521
1882	7,210	5,010	1,267	2,731	12,722	1,401	5,463	13,083	5,385	10,326	2,101	66,709
Working oxen.												
1866 to 1870	40	2	25	1,261	1,774	41	3	8	133	4,649	2,590	10,486
1871 to 1880	40	2	30	1,325	1,847	21	2	2	71	4,218	2,487	10,640
1881	115	3	28	1,152	1,713	1	1	69	5,810	2,338	8	9,219
1882	41	2	14	1,125	1,553	42	1	111	5,674	2,330	8	8,892

The statement next following shows the total number of cattle of every description in each of the provinces and in the Netherlands from 1851 to 1860; from 1861 to 1870; from 1871 to 1880; and in 1881 and 1882:

Provinces.	1851 to 1860.	1861 to 1870.	1871 to 1880.	1881.	1882.
Groningen	101,406	102,483	97,845	93,510	90,883
Friesland	189,284	202,634	208,493	205,385	204,412
Drenthe	54,762	62,088	60,453	63,739	66,280
Overysel	108,400	117,612	196,369	125,549	126,837
Gelderland	157,104	171,422	184,639	187,993	180,913
Utrecht	72,031	75,997	82,235	85,663	86,049
North Holland	141,643	141,515	146,696	149,000	150,677
South Holland	179,011	192,218	211,584	215,032	213,177
Zeeland	47,564	53,284	58,529	59,663	60,166
North Brabant	150,573	171,185	178,272	177,840	176,159
Limburg	58,760	65,611	72,597	73,718	72,457
Total	1,260,841	1,358,249	1,435,716	1,434,406	1,427,557

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DECREASE IN THE CATTLE OF HOLLAND.

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The agricultural report of the Netherlands covering the year 1881, and which has only recently been published, shows that the cold and rough weather in the months of April and May of that year was extremely damaging to the pasture lands, and that farmers who already had their stock out in pasture were compelled to house them again or turn them into their meadows or hay fields.

It was not until June that the growth of grass began to revive, and the prospect for a good hay year seemed better.

Still the first cut of hay turned out but a very indifferent product both as to quantity and quality, whereas the second mowing, owing to almost constantly prevailing rains, resulted far more disastrous and yielded in many places hardly any hay crop at all.

In consequence thereof it was found that at the end of the year 1881 the stock of cattle in the country had decreased by over 35,600 head as compared with same period of 1880.

A further decrease in the number of cattle is now reported as having occurred in 1882, amounting to about 6,500 head; caused by the scarcity of fodder, grass, clover, hay, and straw during the winter of 1881-'82.

But as the last and the current years proved both to be far more favorable grass years and yielded abundant hay crops, the decrease of about 4,100 head in 1881 and in 1882 will, most likely, soon be made up for again, if that is not the case already.

STOCK RECUPERATIVE POWER OF HOLLAND.

A temporary decline in the numerical condition of the stock of cattle occasions in this country no particular uneasiness, as it is generally and well understood that the country's recuperative powers in this respect are very great, and that under anyways favorable circumstances its efficacy for stock-raising is prodigious.

As an illustration hereof the following is stated: In 1866 the stock of cattle, in consequence of the cattle-plague, had been reduced to 1,302,600 head, and in 1867 there were again 1,361,300 cattle in the country, and in 1870, 1,410,800; thus in the comparatively short space of time (four years), the increase amounted to 108,200 heads.

So has it happened in 1864 and in 1871, that on account of the scarcity of grass, clover, hay, and straw the stock showed a shrinkage of 45,300 head in the former and of 34,800 head in the latter year as against the previous years respectively, but it was in both cases replenished in the course of but few years.

From facts and figures above stated may, in a measure, be deduced that the stock of this country is more than sufficient for home demands, and that such is actually the case will be further realized by a glance at the figures given below, and representing the exports of cattle from this country during the last five years and during the nine months of the current year, viz:

Exports of Dutch cattle.

Years.	Number of cattle.	Years.	Number of cattle.
1878.....	134,711	1881.....	144,456
1879.....	138,130	1882.....	154,916
1880.....	144,421	1883 (9 months).....	99,955

North Brabant.	Limburg.	Total.
640	550	14,085
830	607	16,334
836	624	17,182
873	638	16,275

103,014	47,018	803,974
102,359	47,463	911,241
99,840	47,663	884,914
99,539	47,282	878,856
58,258	18,054	380,620
61,333	20,105	434,625
63,019	20,270	450,567
61,735	20,100	437,104

9,668	1,063	57,210
9,529	1,035	65,476
10,325	1,813	66,324
10,326	2,101	66,769

4,649	2,590	10,466
4,215	2,487	10,040
3,810	2,338	9,219
3,674	2,530	8,892

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1881.	1882.
93,510	90,837
95,385	204,412
95,739	66,280
95,549	120,839
97,933	180,911
95,663	86,044
99,000	150,675
15,632	213,122
9,663	60,166
17,840	176,159
2,718	72,407
14,406	1,427,552

Of the stock exported two-fifths or thereabouts consisted of calves and heifers (young cattle), and the other three-fifths of beef cattle and milch cows, &c.

The countries to which nearly all the surplus cattle were and are generally shipped, are: Belgium, England, Germany (Prussia), and the United States.

IMPORTS OF LIVE STOCK INTO HOLLAND.

The imports of live stock into Holland are comparatively so trifling as hardly to deserve mention, but as they figure in the customs returns of the country I would state that in 1878 they amounted to 4,414 head; in 1879 to 2,837 head; in 1880 to 1,561 head; in 1881 to 275 head; and in 1882 to 1,406 head.

IMPORTS OF AMERICAN CHEESE, BUTTER, AND OLEOMARGARINE.

Whilst it is hardly necessary to say that this country produced more butter and cheese than is required to supply the home demand and that very large quantities are annually exported, I would remark, nevertheless, that the imports and consumption of foreign, especially French and Swiss, cheese are quite considerable.

It is possible that certain kinds of American cheese would, in limited quantities, find a market here if proper efforts to introduce them would be made, which hitherto has not been done.

That enormous quantities of oleomargarine are annually imported into this country, and that the bulk of it comes from the United States, are well known facts.

In my report on this subject of September 12, 1882, I gave the estimated quantity imported during the year ended June 30, 1882, as having been about 80,000 tierces. I am now informed that the transactions in the article have since been most satisfactory, and that the imports of it have still further and greatly increased.

MEAT IMPORTS FROM THE UNITED STATES.

The meat imports from the United States, corned beef, in barrels and cans, and canned beef, tongues, &c., have fallen off very much within the last year or two, but this seems to be owing more to the fact that these articles no longer find their way so generally into the houses and on the tables of the wealthy and well-to-do classes here as was formerly the case than to anything else.

PICTURES OF DUTCH CATTLE.

I inclose two photographs of representative animals, owned by Mr. Amersfoort, the breed, color, and peculiarities of the same being noted thereon.

D. ECKSTEIN,
Consul.

UNITED STATES CONSULATE,
Amsterdam, November 30, 1883.

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When born

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March 3, 1880
July 5, 1881
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1882
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DUTCH MILCH COWS.

Extracts from the milk list kept at the Badhoeve (Bath farm) in the lake of Haarlem, Holland.

[The milk was weighed every Saturday.]

PRODUCT FROM THE COW WOUTJE.

The Woutje was born in May, 1875, and bought when a calf at the market in Leyden, South Holland. The following is her milk record for six years, viz, 1878-'83:

Year.	Milking weeks.	Total yield.
1878 (April to November).....	34	<i>Kilos.*</i> 2,700
1879 (March to November).....	38	3,504
1880 (March to December).....	43	4,571
1881 (January to February, July to December).....	36	3,423
1882 (January to September).....	30	2,527
1883 (February to October).....	38	4,441

* Every kilogram of milk may be considered a liter.

*Woutje's calves.**

When born.	Name.	Color.	Name of bull.
April 1, 1878.....	(337) Bloosje, female..	Black; white head and belly...	(270) Zegan.
March 3, 1879.....	(394) Chloris, male....	do.....	(288) Zoro.
March 3, 1880.....	(516) Dahlia, female...	do.....	(327) Aron.
July 5, 1881.....	(653) Eland, male.....	do.....	(394) Chloris.
July 5, 1881.....	(654) Elders, male.....	do.....	Do.
1882.....	No calf.....		
February 4, 1883.....	(841) Geesje, female...	Black; white head and belly...	(639) Erst.

* Figures in () represent Nos. of animals in Mr. Amersfoort's herd book.

PRODUCT FROM COW SUZETTE.

This cow was calved in the Lake of Haarlem March 12, 1871. Nothing further is known of her antecedents than that she came of Dutch breed. The record shows that the Suzette had her first calf February 20, 1874, and her subsequent calves on May 8, 1875; May 14, 1876; May 20, 1877 (no calf in 1878); March 20, 1879. The Suzette was sold, dry, on April 20, 1880.

Milk record for seven years.

Year.	Number of milking weeks.	Total yield.
1874 (February to December).....		<i>Kilos.</i> 4,627
1875 (January, May to December).....	45	4,802
1876 (January to February, May to December).....	40	5,124
1877 (January, April to December).....	42	5,271
1878 (January to December).....	49	3,980
1879 (April to December).....	48	4,578
1880 (January to March).....	39	980

Special statistics concerning
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[Prepared for Consul Eckstein, by Mr. J. P. Amersfoordt, of Badhoeve, near Amsterdam.]

District.	Annual average yield of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Habitat.	Size of cow at maturity.			Live weight.		
					Length.	Breadth.	Height.	Cow.	Bull.	Os.
<i>Liters.</i>										
Groningen	4,500	4 to 4½ per cent		Northwest Quarter	<i>Meters.</i> 2	0.38	1.31	430	550	500
Do	4,000	4 to 5 per cent		Hunzego.	1.92		1.24	325		
Do	3,000			Southwest Quarter	2.05		1.38	300		
Friesland	4,500			Sea-clay polders.				450		
Do	5,000	Good		Fens						
Drenthe	2,000		Good	Divulval sands	2.20	0.53	1.47	250		
North Holland	5,200	4 liters for 1 kilogram of butter.	Cheese 6 per cent.	Polders, Great, Fens				450		
South Holland	4,500	Butter 4 per cent	Cheese 6 per cent	All sorts of alluvial soils	2.20	0.58	1.44	400		
Zeland	2,500	4 per cent		Islands						
North Brabant	2,000			Sandy heath lands						
District.	Age at maturity.	Weight of meat at maturity.	Color.	Description of.	How long bred pure.	Origin of breed.	Product.			
							Meat.	Milk.	Cheese.	
<i>Years.</i>										
Groningen	5	450	Black, white nose, head, and belly, black nostrils.	Fine head and limbs, neat horns, fine tail.	Several centuries.	Aboriginal	Meat	Milk.	Cheese.	
Do	5	350	Black, white head.	Very hardy	do	do	do	do	do	
Friesland	4 to 5	300	Spotted, black and white	Smaller	do	do	do	do	do	
Do	4 to 5	450	Spotted, white and black	Large	A° 1550	do	do	do	do	
Drenthe	4 to 5	450	do	Smaller, lighter.	Several centuries.	Aboriginal.	do	do	do	
North Holland	4 to 5	400 to 500	White, spotted with black	Large breed	Mostly Friesian	The aboriginal is a very good breed.	do	Milk.	Cheese.	
South Holland	5 to 6		White, black, spotted, and all colors; very large breeds, and also according to soil different according to soil.	All sorts of breeds	Mixed breed	All parts of the Netherlands.	do	Milk.	Butter and cheese.	
Zeland	5	450	Black, white backs	A rough breed, severe climate.	Aboriginal	At least since five centuries, the breeding country.	do	Milk.		
North Brabant	4	250	All colors	Small, not fat	Mixed		do			

Topography.

Districts.	Altitude.	Mean temperature.	Summer, July.	Winter, December.	Alluvial.	Loam.	Soil.	Clay.

South Holland.....	3 to 6	White, black, spotted, and all other colors; very large breeds, and also smaller; weight different according to soil.		All sorts of breads..... Mixed bread.....	At least since five centuries, the neighboring country.	Milk..... Butter and cheese.	Cheese.
Zee land.....	5	450	Black, white backs.....	A rough breed, severe climate. Sand, not fat	Mixed	Milk.....	Milk.....
North Brabant.....	4	250	All colors.....				

Topography.

Districts.	Altitude.	Mean temperature.	Summer, July.	Winter, December.	Alluvial.	Loam.	Clay.	Sandy, &c.
Groningen; Groningen.....	AP.....	Cent. 9.33	Cent. 18.06	Cent. 2.47	North, sea clay; south, diluvial moors, high turf clay.		Marine clay.....	Diluvial sands.
Friesland; Leeuwarden.....	AP.....	9.64	18.32	2.66	North, alluvial sea clay.			South, peat.
Drenthe; Assen.....	AP meter + 10.....	9.56	18.59	2.63			Along the brooks.....	Diluvial sand.
North Holland; Amsterdam.....	AP-3 ^m (polders).....	9.94	17.76	3.50	Alluvial.....		In the polders marine clay.	Sand in dunes: low moors, peat.
South Holland; Hellevoetslijs.....	AP-2 ^m -8 ^m (polders).....	10.41	18.86	3.28	Alluvial.....	Near the Rhine.....	In the polders marine clay.	Sand in dunes: low moors, peat.
Zeeland; Flushing.....	AP-2.....	10.54	18.50	4.20	Alluvial.....		Marine clay.....	Sand in dunes.
North Brabant; Maastricht.....	AP-30 ^m	11.08	20.12	3.57	Diluvial.....	Loam.....		Diluvial and alluvial sand.

* AP signifies the level of the sea at Amsterdam.

Substratum.

Districts.	Limestone.	Sandstone.	Granite.	Clay.	Gravel, &c.	Cultivated grasses.		
						Timothy.	Clover.	Rye-grass, &c.
Groningen		In the hills		Sea clay	From the Rhine	Timothy.	Red and white.	Rye-grass.
Friesland				Sea clay	do	do	do	do
Drenthe			Erratic blocks from the Rhine	Marine clay	do	do	do	do
North Holland				Marine clay	do	do	do	do
South Holland				Marine clay	do	do	do	do
Zeeland				Marine clay	do	do	do	do
Limburg	Limestone, coal measures	In the hills	Erratic blocks from the Meas.		Mass diluviums	do	do	do
Methods of housing.						Feeding.		
Groningen	Large farm-houses			Hay, straw, mangolds			Breeding country.	
Friesland	Large farm-houses			do			do	
Drenthe	Small farms			Straw, heath, turnips, rye, spurry			Breeding.	
North Holland	Covered hay-stacks, cheese-houses, stabling round the wall.			Chaff, straw.			Very few breeding.	
South Holland	Movable hayricks, butter cellars, cheese-rooms, stabling in the middle of the house.			Distillery feeding; Schedam			Very few breeding.	
Zeeland	Large farm-sheds for tillage			Feeding			Breeding.	
North Brabant	Granaries			Feeding			Breeding.	
Limburg	Flemish, small culture.			do			do	

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THE CATTLE OF HOLLAND.

REPORT BY CONSUL WINTER, OF ROTTERDAM.

In compliance with circular of July 18, 1883, and its memoranda of August 25, 1883, I have prepared the following report upon the cattle of Holland.

To obtain the necessary information I addressed Mr. C. J. M. Jongkandt Coning, director of the Government agricultural school at Wageningen, and I transmitted to him a copy of the forms annexed to the cattle circular. In his reply he intimated, however, that the filling out of those forms was impossible to him, as such would require a special study.

I have, however, succeeded in obtaining the following information, for the greater part of which I am indebted to the above-named gentleman, and the balance was obtained from official and reliable sources.

THE DIFFERENT BREEDS IN HOLLAND.

The different breeds and their percentage in the Dutch stock are as follows:

	Per cent.
Groningen breed	7. 02
Frisian breed *	18. 15
Holland breed	7. 08
Flemish or Zeeland breed	3. 83
Gelderland breed	7. 08
Drenthe breed	1. 42
Frisian-Drenthe-Gelderland breed	13. 61
Groningen-Frisian-Gelderland breed	23. 81
Flemish-Gelderland-Holland breed	15. 52
Miscellaneous breeds	2. 48

The Frisian breed is considered as very good breeding cattle, and is principally found in the provinces of Friesland and Drenthe.

The Holland breed is principally found in the Purmer and the Beemster, in the province of North Holland. This is probably the breed from which the Shorthorns have been raised in England, although it is still doubtful whether the Flemish cattle must not be considered as the primitive breed of the Shorthorns.

The Drenthe breed is so much like the Ayrshire breed of Scotland that it is nearly impossible to distinguish a thoroughbred Drenthe cow from an Ayrshire cow. The best animals of this breed are found in Salland, province of Overijssel.

The Flemish or Zeeland breed was found all over the Netherlands about two centuries ago, and the type of it has been preserved in the celebrated painting of "Potter's bull." In present times it is only found in the province of Zeeland and the southern parts of South Holland.

The following statements are herewith transmitted:

A.—Number of bulls, milch cows, calves, and heifers, fat cattle and oxen in each province and in the whole country of the Netherlands during 1881, and the average number of the last ten years.

B.—Increase or decrease of cattle in 1881, as compared with 1880.

The decrease of about 35,300 head of cattle in 1881 was principally caused by the bad harvest of grass and hay in 1881.

C.—Total numbers of cattle during the last twenty years.

* So-called Holstein cattle.

PRICE OF DUTCH CATTLE.

The average prices of cattle in the principal markets of the Netherlands during the last five years were as follows:

Cattle.	1878.	1879.	1880.	1881.	1882.
	<i>Florins.</i>	<i>Florins.</i>	<i>Florins.</i>	<i>Florins.</i>	<i>Florins.</i>
Amsterdam:					
Fat cattle.....	250	285	270	250	250
Milch cows.....	260	270	250	240	240
Grass calves.....	45	36	36	36	36
Young calves.....	9	9	8	8	19
Leouwarden:					
Fat cattle.....	305	275	260	265	265
Milch cows.....	235	230	200	190	211
Grass calves.....	64	42	50	30	54
Fat calves.....	53	51	50	39	42
Young calves.....	750	8	7	7	5
Gronigen:					
Fat cattle.....	245	200	225	255	200
Milch cows.....					250
Ordinary cattle.....	165	150	160	150	165
Rotterdam:					
Oxen.....	200	270	275	275	270
Cows.....	250	230	235	220	230
Calves.....	55	60	62	60	76
Young calves.....	12	10	10	10	19
Zwolle:					
Bulls.....			205		
Milch cows.....			280	260	
Calves.....			48	35	

CATTLE IMPORT AND EXPORT OF HOLLAND.

The following statement shows the number of cattle imported into and exported from the Netherlands during the last five years:

Year.	Import.	Export.
1882.....		
1881.....	1,406	154,916
1880.....	275	144,446
1879.....	1,561	144,421
1878.....	2,857	138,130
	4,414	134,711

In 1882 1,152 head of cattle were imported from Germany and 228 from Belgium; of the total number of cattle exported in 1882, 64,060 were exported to Belgium, 44,586 to England, 45,816 to Germany, and 351 to the United States.

EXPORT OF DUTCH CATTLE TO THE UNITED STATES.

The best methods of exportation of breeding cattle to the United States are via London or via Antwerp.

The best animals of the Dutch cattle for exportation for breeding purposes are those of the Holland and Frisian breeds. The prices are 800 to 900 florins* for bulls, 250 to 400 florins for cows, 200 to 250 florins for heifers, and 120 to 150 florins for calves. The through rates from Rotterdam to New York or Boston vary from £4 to £5 for a calf; from £5

* Florin = 40.2 cents American.

to £6 for
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per ton.

UNITED
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Provinces.

Gronigen.....
Friesland.....
Drenthe.....
Overijssel.....
Gelderland.....
Utrecht.....
North Holland.....
South Holland.....
Zeeland.....
North Brabant.....
Limburg.....

Total

Gronigen.....
Friesland.....
Drenthe.....
Overijssel.....
Gelderland.....
Utrecht.....
North Holland.....
South Holland.....
Zeeland.....
North Brabant.....
Limburg.....

Total

B.—

Province

Gronigen.....
Friesland.....
Drenthe.....
Overijssel.....
Gelderland.....
Utrecht.....
North Holland.....
South Holland.....
Zeeland.....
North Brabant.....
Limburg.....

Total

to £6 for a heifer; and from £6 to £7 10s. for a cow or bull, and in addition 10 per cent. primeage and sufficient fodder for twenty days.

The average price of hay is \$20 per ton, and of straw from \$12 to \$14 per ton.

JOHN F. WINTER,
Consul.

UNITED STATES CONSULATE,
Rotterdam, December 27, 1883.

	1881.	1882.
<i>Florins.</i>	<i>Florins.</i>	<i>Florins.</i>
270	250	250
250	240	240
36	36	36
8	8	10
260	305	285
200	190	211
50	30	42
50	30	51
7	7	5
225	250	200
160	150	250
275	275	185
235	230	250
62	60	76
10	10	10
85	.....	.....
80	260	.....
48	35	.....

A.—*Number of cattle in the Netherlands.*

Provinces.	Bulls.		Milch cows.		Calves and heifers.		Fat cattle.		Oxen.	
	1871-'80.	1881.	1871-'80.	1881.	1871-'80.	1881.	1871-'80.	1881.	1871-'80.	1881.
Groningen.....	1,795	1,787	51,187	43,007	37,252	49,541	7,571	8,069	40	115
Friesland.....	3,288	3,063	446,255	136,798	54,905	60,942	4,075	4,559	40	39
Drenth.....	4,872	4,007	39,602	34,877	24,812	24,312	1,173	1,325	30	28
Overijssel.....	1,673	1,702	83,442	81,930	36,866	38,052	3,024	2,887	1,325	1,152
Guelderland.....	1,434	2,074	90,342	61,939	21,170	17,741	13,226	13,121	1,847	1,713
Friesland.....	1,079	1,313	60,991	60,090	21,170	31,725	4,744	4,971	21	1
North Holland.....	1,494	1,538	109,482	110,766	30,976	31,725	4,744	4,971	21	1
South Holland.....	3,005	2,658	146,504	145,139	49,372	54,348	12,611	12,887	2	—
Zeland.....	786	973	27,149	26,121	25,930	27,671	4,581	4,934	7	—
North Brabant.....	836	850	102,359	99,806	61,333	63,019	9,529	10,325	4,215	3,810
Limburg.....	607	634	47,463	47,063	20,105	20,270	1,935	1,813	2,487	2,348
Total.....	16,334	17,182	911,241	884,914	434,025	456,567	63,476	66,524	10,010	9,219

Provinces.	Total.			
	1851-'60.	1861-'70.	1871-'80.	1881.
Groningen	101,406	102,483	97,845	93,516
Friesland	180,284	202,534	208,435	205,383
Drentho	54,762	62,988	60,455	65,738
Overijssel	108,400	117,612	120,369	125,849
Gelderland	157,704	171,422	184,235	183,993
Utrecht	72,931	75,997	84,235	85,658
North Holland	141,043	141,515	146,696	149,000
South Holland	179,011	192,218	211,584	215,623
Zweland	47,564	63,684	58,529	59,663
North Brabant	150,576	171,185	178,272	177,840
Limburg	58,700	65,611	72,597	72,616
Total	1,260,841	1,358,249	1,435,716	1,434,406

B.—The increase (+) or decrease (—) of cattle in 1881 against 1880.

Provinces.	Bulls.	Milch cows.	Calves and heifers.	Fat cattle.	Oxen.	Total.
Gronigen	+ 30	= 805	= 187		= 160	= 1,142
Friesland	= 153	= 4,737	= 2,170	+ 41		= 6,441
Drenthe	= 36	= 1,630	= 2,328	426	= 1	= 6,441
Overijssel	= 8	= 3,258	= 1,426		= 2	= 3,785
Gelderland	+ 309	= 1,303	= 1,466	= 1,100	= 33	= 4,949
Friesland	+ 128	= 782	= 319		= 66	= 3,626
South Holland	= 165	= 339	= 236	+ 415	= 5	= 1,760
North Holland	= 288	= 7,155	+ 1,236	= 639	= 6	= 8,894
Zeeland	= 3	= 774	= 4	= 423	+ 8	= 7,014
North Brabant	= 74	= 591	+ 62	= 255	= 304	= 1,190
Limburg	= 204	= 985	= 684	= 146	= 123	= 2,142
Total	= 380	= 23,003	= 9,130	= 1,989	= 605	= 35,293

C.—Number of cattle in the Netherlands during the last twenty years.

Years.	Number.	Years.	Number.
1861.....	1,335,300	1872.....	1,377,000
1862.....	1,374,000	1873.....	1,432,100
1863.....	1,380,600	1874.....	1,463,100
1864.....	1,334,800	1875.....	1,456,700
1865.....	1,314,100	1876.....	1,439,200
1866.....	1,302,600	1877.....	1,445,000
1867.....	1,361,300	1878.....	1,456,500
1868.....	1,368,200	1879.....	1,461,500
1869.....	1,401,000	1880.....	1,469,700
1870.....	1,410,800	1881.....	1,434,400
1871.....	1,376,000		

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RUSSIA.

CATTLE-BREEDING IN RUSSIA.

REPORT BY CONSUL-GENERAL STANTON, OF ST. PETERSBURG.

LACK OF CATTLE STATISTICS IN RUSSIA.

Referring to the Department's circular of July 18, 1883, I have the honor to transmit herewith a translation of a document forwarded to this office from the Russian department of agriculture.

In the letter accompanying this document the director of the department of agriculture, General Razeffsky, informs me that the minister has just appointed a committee of experts to inquire into the system of cattle-breeding in Russia, both from an economic and technical point of view.

The proceedings of the committee will be published in a separate report and sent in due course to the consulate-general.

This report shall be translated and forwarded to the Department immediately upon its receipt.

I regret that the information supplied by the department of agriculture should be so meager and indefinite, but transmit it, hoping it may contain possibly something of interest.

I am promised full replies for Finland, and still hope to secure further details for Russia.

CATTLE BREEDS IN RUSSIA.

The cattle raised in Russia are principally local breeds and seldom crossed with foreign varieties.

They are mostly small, the height over the shoulder being from 1 meter to 1.15, the minimum being 0.90, the maximum 1.35 meters. The difference in height is due to surrounding conditions.

A great many foreign breeds have been imported for private estates; but up to the present time there are no regular breeding establishments for mixed varieties.

MILKING QUALITIES OF RUSSIAN CATTLE.

Only the Kolmogory cattle, the product of crossing local cattle with Dutch breeds, which exists at the mouth of the Düina, present a regular and settled type.

They are remarkable for their yield of milk, and are the favorite breed in St. Petersburg, where a great number of cows of this breed are brought.

Number.

1,377,000
1,432,100
1,462,100
1,476,700
1,492,200
1,432,000
1,176,500
1,461,700
1,462,700
1,431,400

The following table gives some particulars as to the Russian and Kolmogony cows :

Breeds.	Live weight.	Milk producing—		Quantity of milk.	
		1 pound butter.	1 pound cheese.	Average.	Maximum.
	<i>Kilos.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Liters.</i>	<i>Liters.</i>
Yaroslaff	240 to 400	25 to 27	8 to 11	1,400 to 1,800	2,400
Vologda and Kostroma	200 320	22 20	8 11	1,200	2,000
Cows in different parts of Tver, Novgorod, and other governments, and on the rivers Oka, Dnieper, &c....	100 220	24 27	8 11	800 2,200	2,400
Kolmogony		27 32	8 11	1,800 2,400	3,000

Some cows give five times their own weight in milk.

The proportion of killed animals to their live weight is generally 3 to 7. *Feeding.*—Russian cows are principally grazed. The winter food is very moderate. Hay or straw is the staple food, some little strengthening matter, as from 1 to 5 pounds of flour or bran per head being added.

Color.—The color of the cows is various, but some colors are peculiar to certain parts. In a great many districts, for instance, black cattle, with white heads, bellies, and feet prevail; in others, red prevails instead of black.

Form.—The form, however, is almost the same everywhere. The animals are small, and mostly short-legged. They have an elongated body, a straight or slightly concave back, sloping hind-quarters, and long tail. The udder is not very prominent, but is considerably developed at the upper part and extends forward.

Rearing calves.—The manner of rearing calves is very middling and even careless.

MEAT PRODUCT.

In the southern and eastern provinces cattle are bred as beasts of burden and for their meat.

Varieties.	Meat.		Tallow.
	<i>Kilos.</i>	<i>Kilos.</i>	
Gray Tcherkasky	400	48	
Black Sea	288	32 to 48	
Don	300	32 48	
Orenburg	224-272	32 48	
Simbrisk	()	()	
Samara	()	()	

EDGAR STANTON,
Consul-General.

UNITED STATES CONSULATE,
St. Petersburg, December 20, 1883.

ADDENDA TO RUSSIAN CATTLE REPORTS.

In view of the efforts which are being made for the development of the beef product of Russia for export, the following statistics and information, compiled principally from a report by Consul-General Stanton

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on the resources of Russia, and published in Consular Reports, No. 51, are given, to supplement the rather meager reports from that country in response to the cattle circular:

Quantity of milk.

Average.	Maximum.
Liters.	Liters.
00 to 1,800	2,400
1,200	2,000
00	2,200
00	2,400
	0,400
	3,000

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Meat.	Tallow.
Kilos.	Kilos.
400	48
288	32 to 48
360	32
224-272	32
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AREA AND POPULATION OF THE RUSSIAN EMPIRE.

The Russian Empire has an area of nearly 395,000 geographical miles, or about one-sixth of the land on the globe. From Ararat to Kolo, the southern and northern extremities, there are 700, and from the eastern and western extremities, Eastcape to Kalish, 2,500 geographical miles.

The frontiers extend over 6,370 geographical miles, 4,350 miles of which are sea-coast. Unfavorable climate and formation, however, limit this littoral, as far as commerce is concerned, to the relatively small portions of the Baltic, Black, and Japanese Seas.

The Empire is divided naturally into three great districts, viz:

Districts.	Square kilometers.	Inhabitants.
European Russia, with Poland and Finland	5,380,028	85,000,000
Caucasus and trans-Caspian districts	700,755	6,000,000
Siberia and Central Asia	15,512,800	9,000,000
Total	21,702,232	100,000,000

European Russia, with one-fifth of the total area, has nearly six times as many inhabitants as all the other districts together. It is divided generally into two zones, the one embracing all the territory without and the other all that with Blackearth, these two zones being again subdivided into nine groups of governments or provinces.

PROVINCIAL CHARACTERISTICS OF RUSSIA.

For a more comprehensive classification of his subject, Consul-General Stanton, in the report already referred to, has grouped the "governments" as follows:

Northern group.—Archangel, Olonektz, and Vologda. These are the least populous districts of Russia, forests and tundra predominating.

Central group.—St. Petersburg, Novgorod, Tver, Pskoff, Smolensk, Moscow, Kaluga, Vladimir, Yarosloff, Kostroma, Nijni-Novgorod, Viatka, and Perm. Agriculture is successfully carried on in all these governments.

Baltic group.—This group consists of the following provinces: Esthonia, Livonia, and Courland. The average crops in these three provinces is much greater than those of the thirteen governments of the central group. Wheat, rye, barley, buckwheat, oats, and potatoes are principally cultivated, the latter being largely used for distilling purposes. Considerable attention is paid to horse-breeding, there being 375,000 in this group, an increase of 32 per cent. since 1851. Cattle have increased 42 per cent. since 1851. The district possesses about 1,006,000 head. Sheep number 1,047,000, 917,000 of which are native breeds. The increase since 1851 is about 70 per cent. Swine number 360,000, having increased since 1851 33 per cent. Forests have decreased since 1851 15 per cent., and their protection and extension is a question of vital importance. Distilling, brewing, and milling are extensively carried on in this district.

Western group.—This group embraces the six governments of Mohileff, Vitebsk, Vilna, Kovno, Grodno, and Minsk, has an area of 203,476 square kilometers, and a population numbering 6,185,000. Spring and winter wheat, rye, barley, buckwheat, oats, potatoes, and flax are cultivated. Horses numbered in 1876 1,499,000, and receive considerable attention. Cattle numbered 2,519,000; sheep, 2,042,000, 371,000 of which were fine-wooled breeds; swine, 1,570,000; goats, 220,000. Forests have been greatly devastated, and have decreased in area more than 3,000,000 desiatines (over 8,000,000 acres). Distilling, brewing, and sugar-making are carried on extensively in this group.

Vistula group.—This group includes the former Kingdom of Poland. The consul-general was unable to give statistics of any account regarding this group. Notwithstanding its dense population this group is a grain-exporting one. Horses in 1870 numbered 754,000; cattle, 2,232,000; sheep, 4,180,000; swine, 1,104,000, and goats 15,000. Forests have been greatly devastated. Distilling, brewing, and sugar-making are, as adjuncts to agriculture, extensively carried on. Statistics concerning Polish cattle will be found in the report from Consul Rawicz, of Warsaw.

Southwestern Blackearth group.—This group includes the three governments of Kief, Podolia, and Volhynia, and is one of the most favored districts of Russia both as to soil and climate.

Beet roots play an important rôle in this group. About 115,957 desiatines were planted, producing 99,242,650 poods.

In 1871 the horses in this group numbered 866,000, having increased 80 per cent. in twenty years; cattle numbered 1,500,000, having decreased 11 per cent.; sheep, mostly native breeds, 2,420,000; swine, 1,258,000; goats, 85,000.

Southern Steppe group.—This group includes the governments of Bessarabia, Cherson, Yekaterinoslaff, Taurida, and the Don Cossacks district, which are more or less characterized by the word steppe.

The greatest part of the grain production of this group is exported. In 1876 the horses numbered 1,185,000; cattle, 3,427,000; sheep, 13,174,000, of which 7,097,000 were merinos; swine, 787,000; goats, 139,000. But little forest exists, and that little is neglected or wasted, and has decreased 35 per cent. since 1840.

Distilling, brewing, and sugar-making are carried on, though the lack of fuel militates against these industries.

Central Blackearth group.—This group consists of the governments of Tula, Riasan, Orel, Koorsk, Voronesh, Tambroff, Pensa, Karkoff, Poltava, and Tchernigoff. Cereals, fruit, and oleaginous and fibrous plants thrive in this group.

The proportionately small amount of grazing land in this group has its influence on the breeding of domestic animals. Horses number 4,358,000; cattle, 4,137,000; sheep, 10,841,000, 1,537,000 of which are merinos; swine, 3,057,000; goats, 141,100. Forests play an unimportant rôle in this group, and have decreased 20 per cent. Pensa, Tambroff, and Orel have the most, Tula and Poltava the least forest land.

There are in this group 68 sugar-mills, whose annual production is valued at 13,172,000 rubles; 745 distilleries, whose production is valued at 80,355,200 rubles; 70 breweries, producing 1,242,700 rubles beer; 940 oil-mills, producing 2,159,400 rubles oil, and 47 tobacco works, producing 3,304,000 rubles tobacco.

Eastern and Southeastern group.—This group includes the governments of Kasan, Simbirsk, Saratoff, Samara, Oufa, Orenburg, and Astrakan. The soil of this group is fertile, except in Astrakan, where its fruitfulness is affected by the salty character of the earth.

Russia is surpasses the average of the Chomins breed of Great's time by constant peasants.

With regard to northern, chiefly for often cross-bred, largely the average and Chomins.

In the selection of meat. They are for their meat and t and are po

Under the Department of Agriculture supplied by the representatives of the land, viz:

Northern of the "Chomins" breed of the Volhynia breeds of the

Central group hornless, and Government and evident cows and the others: those of Persia and the same.

Finland.—however, to according to large portion

As it would be the case in the report, selected cattle given thought, fair

RUSSIAN CATTLE.

Russia possesses more cattle than any other country in Europe, but is surpassed in this respect by both the United States and South America. Of the many native breeds few if any are worthy particular notice. The Cholmogory, originally a cross between Dutch cattle and a native breed of Archangel, is the best known race. It dates from Peter the Great's time, is used for improving other native breeds, and is kept up by constant import of Dutch bulls. The breed is mainly owned by peasants.

With regard to cattle Russia may be divided into three zones, the northern, southern, and southeastern. In the first cattle are kept chiefly for dairy purposes and manure. The breeds kept are native, often crossed with foreign breeds, are small in stature, and not particularly large milkers. The Russian races develop slowly and possess on the average from 7 to 8 poods of coarse, unsavory meat. West Russian and Cholmogorian cattle weigh from 17 to 20 poods.

In the second zone cattle are kept as beasts of burden and for their meat. They are largely exported, and, though poor milkers, are esteemed for their meat and as workers.

In the southeastern zone oriental breeds are kept chiefly for their meat and tallow. They yield less meat than those of the southern zone and are poor milkers.

PICTURES OF RUSSIAN CATTLE.

Under date of December 5, 1884, Consul-General Stanton transmitted to the Department sixty photo-lithographs of Russian cattle, which were supplied by the director of agriculture in St. Petersburg. These pictures represent cattle in the northern and central groups only and in Finland, viz:

Northern group.—Government of Archangel, four representing cows of the "Cholmogorian" breed and four of unspecified cattle; Government of Vologda, seven cows and seven oxen, evidently of the common breeds of the country.

Central group.—Government of Perm, nine cows, five of which are hornless, and all evidently the common scrub race of the country. Government of Viatka, five cows, fully as inferior as those of Perm, and evidently of the same breed. Government of Kostroma, fifteen cows and three bulls. One of the cows is designated "native cow;" the others are not designated. All are superior looking animals to those of Perm and Viatka. Government of Yaroslaff, four cows seemingly the same breed as those of Kostoma.

Finland.—A cow and bull, breed not designated. They would seem, however, to be a cross between the Finnish and Ayrshire cattle, which, according to the report from Helsingfors, would seem to constitute a large portion of the cattle of Finland.

As it would serve no practical purpose to publish the sixty engravings of Russian cattle which accompanied Consul-General Stanton's report, selections are herewith given, which, with the cuts of Polish cattle given with the report by Consul Rawicz, of Warsaw, will, it is thought, fairly represent the breeds of the Empire.

CATTLE IN THE BALTIC PROVINCES.

REPORT BY CONSULAR AGENT BOMBOLDT, OF RIGA.

I have the honor to inclose herewith a report having reference to the breeding of cattle in this consular district, but I regret to say that the information I have been able to collect upon this subject is very limited, as pure bred cattle are very rarely found in these provinces, where stock-raising is in a primitive state. The domestic cattle in their present condition would not be recommendable for export. The only cattle fit for exporting are the Podolian (prairie breed from the south of Russia), which is renowned for its contentedness with regard to food and attention, as also for its large size and excellent quality of meat. The risk of spreading the cattle plague in other countries must be taken into consideration in this connection. By continual and exact experiments in breeding the Podolian cattle in the United States it could be ascertained whether this very useful cattle would not lose its disposition to disease, under the influence of the soil and climate there. These cattle cost here from \$40 to \$60 per head. In Libau a large slaughtering establishment has been formed this spring with the view of exporting fresh meat to England, and it has its own steamer, fitted with refrigerators, running regularly to London. The cattle, especially Podolian, come from the interior of Russia by rail to Libau.

The best manner of export to the United States would be via England. The cost from Riga to England for cattle varies from about \$18 to \$20 per head. The stock is increasing and is sufficient for home demand.

PET. BOMBOLDT,
Consular Agent.

UNITED STATES CONSULAR AGENCY,
Riga, November 8, 1883.

Special statistics concerning cattle in the Baltic provinces.

Name of breed.	Annual average product of milk.	Habitat.	Live weight.	
			Cow.	Bull.
	Pounds.		Pounds.	Pounds.
Angeln.....	4,900	Russia.....	850	1,350
Oldenburg.....	4,800	Baltic provinces.....	1,040	1,670
Cholmogorian.....	4,800	Livonia and Curonia.....	1,000	

Domestic cattle (cross-breeds): Of middle size and mostly small of stature; color, brown and reddish, also gray and white. Age at maturity, three to four years, when their weight is from 540 to 725 pounds. Origin, a cross between foreign and domestic cattle. They are not used for labor. Weight of meat, 290 to 300 pounds. They produce from 276 to 324 gallons of milk yearly. Product of cheese not known.

Topography: Altitude, 90 feet; temperature, summer, 66° F.; winter, 13° F.; soil, alluvial and sand, with some loam; substratum, clay.

Cultivated grasses: Timothy, clover, and rye grass.

Housing: In stables, on the dung mixed with straw and left there until spring.

Feeding: In winter, hay, straw, bran; in summer, pasture.

Breeding: Angeln, Oldenburg, Cholmogoren, country, and cross-breeds.

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Julius R. R. Co. Inc.





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Julius Ross & Co. Ltd.



GRAY HORNLESS COW

Delaware River & Co. Inc.



GRAY HORNLESS COW

Del. by P. H. & Co. 1875

DARK GRAY HORNLESS OX

PLATE 100. 1900. 1900.



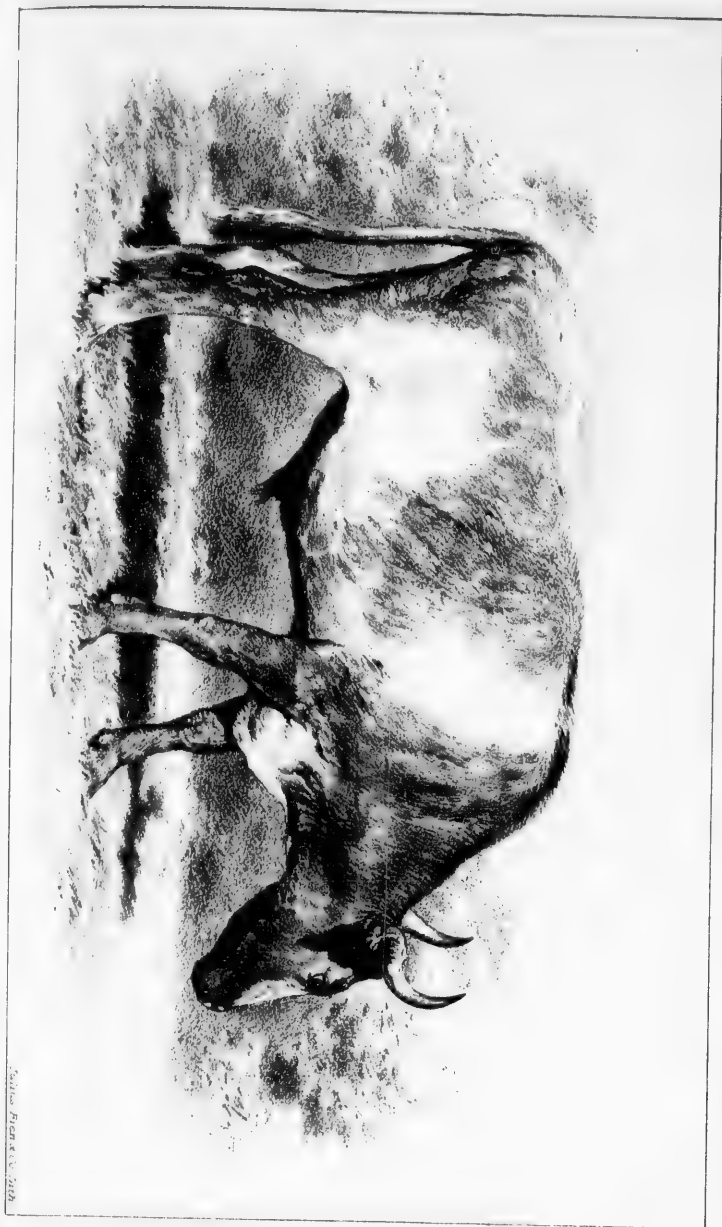
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RED AND WHITE BULL

Julius P. Brown & Co. 1878

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Julius Brann & Co. Ltd.





PLATE 138

BLACK BULL

Julius Bend Co. Lith.

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Fig. 4. 1. 1. 32

Colours from 1718







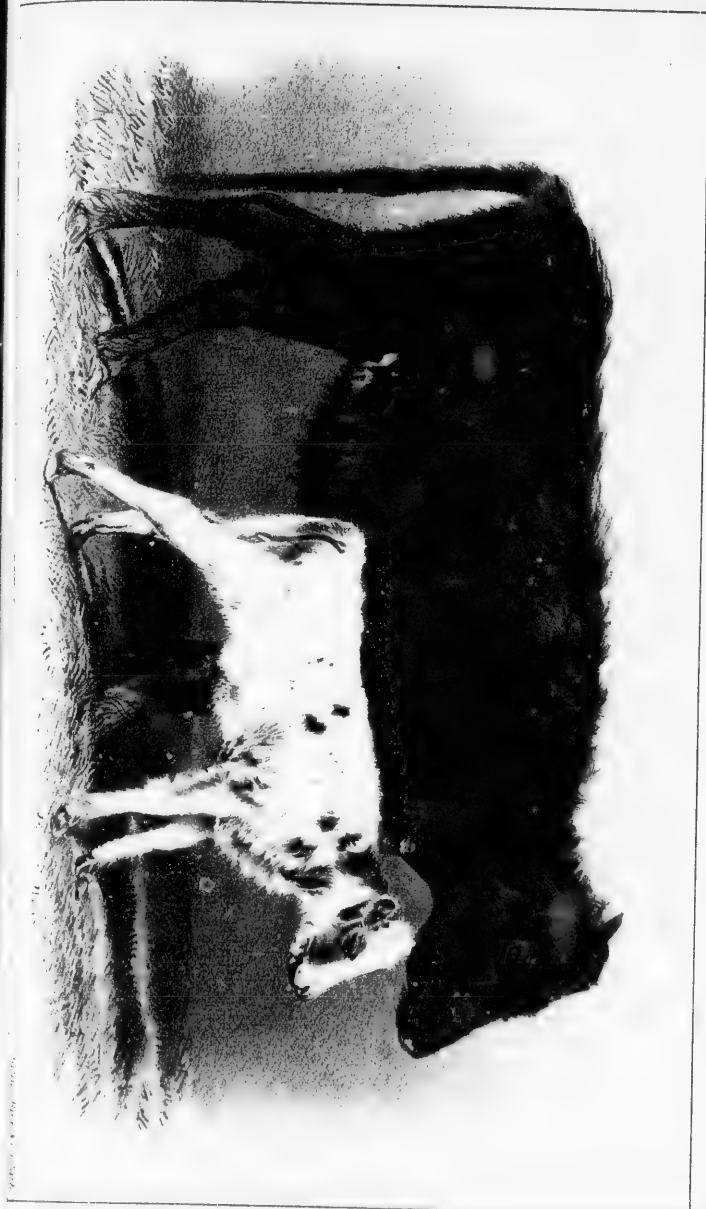
Fig. 1. A. 1887.



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Copyright, 1900, by the Author.





WHITE BULL WITH RED EARS

Pulling From # to 41th



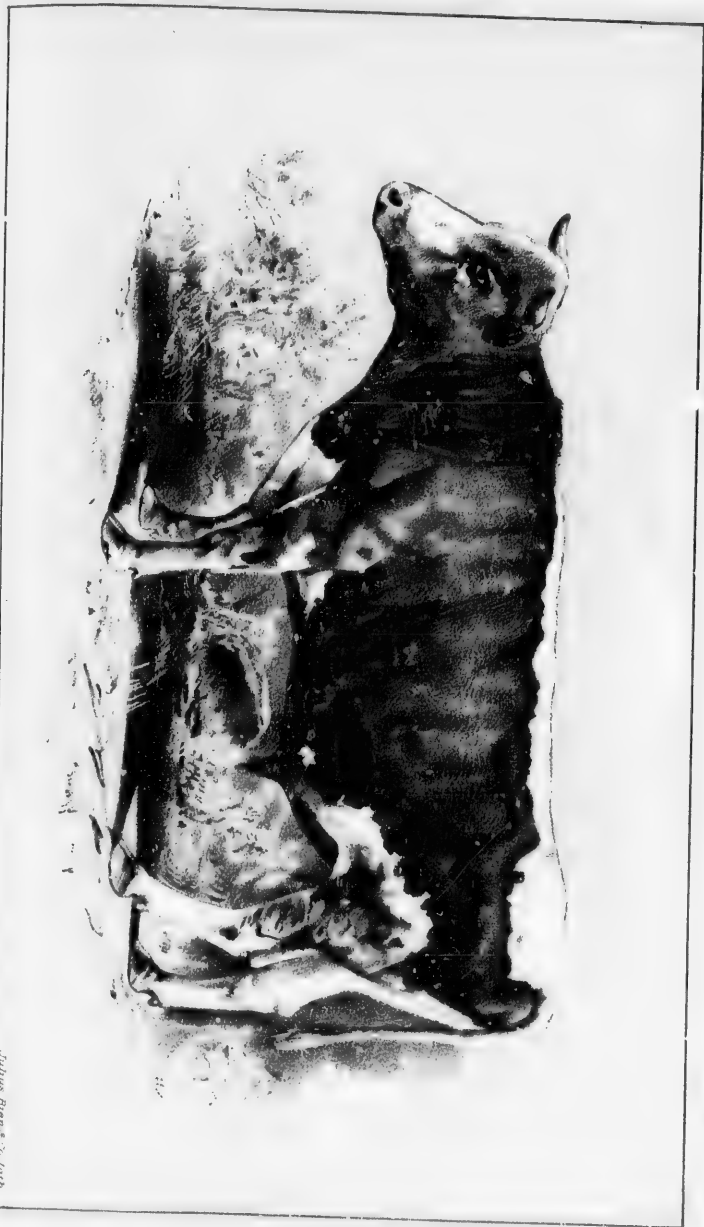


Julius P. R. & Co. Lith.

WHITE BULL WITH RED EARS

A FINNISH GULL

Julius Riiser-Lundin



A FINISH GULL

Julius Pongé sculp.



Quail, Japan, 1892.



Engraving from the 18th century.

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BOS PRIMIGENIUS

Antelope, Bos, & C. 1870



BOS PRIMIGENIUS

British Museum, London

ROY. LATHMON.

Value Penn. 2.00





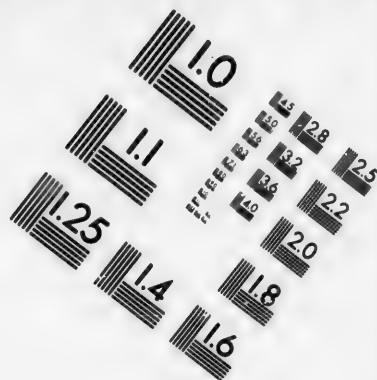
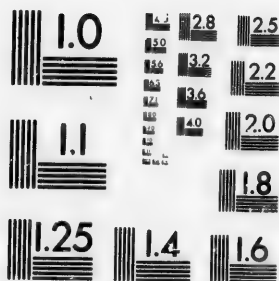
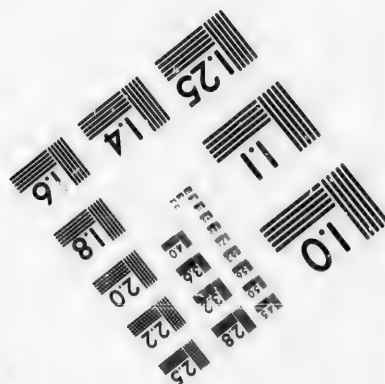


IMAGE EVALUATION TEST TARGET (MT-3)



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Photographic Sciences Corporation

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WEBSTER, N.Y. 14580
(716) 872-4503**

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Julius P. Ross Co. 1912



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CATTLE IN FINLAND.

In compliance with circular of the 18th July, 1883, I have herewith the honor to forward answers to the several questions referred to therein. There is an export of cattle from Finland to Sweden, but there is no import except a few now and then from Ayrshire, for breeding purposes.

HERMAN DONNER,
Vice and Acting Consul.

UNITED STATES CONSULATE,
Helsingfors, June 26, 1884.

SPECIAL STATISTICS CONCERNING CATTLE IN FINLAND.

Name of breed, &c.: Ayrshire, pure and half blood, crossed with original Finnish breed. Color, red and white, spotted, sometimes roan. They are the well-known Ayrshire type; have been bred pure for thirty years; originally from Scotland. Age at maturity four years, when the weight of meat is from 400 to 700 pounds. Size at maturity: Cow from 50" to 80"; ox, from 56" to 86"; while the bull at two and one-half years is from 54" to 80". Live weight: Cow, 800 to 1,000 pounds; bull, 1,200 to 1,300 pounds; ox, 1,000 to 1,100 pounds. Annual average production of milk from 3,200 to 6,000 pounds; from 23.3 to 26 pounds of milk produce 1 pound of butter; the average product being 180 pounds. No cheese is made in the neighborhood.

Topography of Finland: Altitude, 300 feet. Mean temperature, $+3.7^{\circ}$ C.; summer, $+11.7^{\circ}$, July being the warmest (mean temperature, $+17^{\circ}$); winter, -4.3° centigrade from November including April (January mean temperature, -7.8°). Soil, alluvial unsatisfactorily spread; loam mergel very scarce but plenty of vegetable moor soil; clay glacial and field clay; sandy, &c., rollstone gravel, down sand, and glacial sand.

Substratum: Granite, clay, gravel, &c.
Cultivated grasses: Timothy most cultivated and is gaining ground every year; red clover is cultivated, but more of Swedish "alsike" (*Arifalim hybridum*); for pasture while clover is mixed; ryegrass does not stand the Finnish winter; *Holcus lanatus* and *Alopecurus pratensis* are much used.

The cattle are housed for nine months and are at pasture only for three months; hay, oats (crushed), linseed cakes, wheat bran, oat, acorns, and straw are used for feed; on large farms the herds are usually kept pure and bulls imported from time to time from Ayrshire; on small farms crossed breeds are prominent. The butter is all exported to St. Petersburg and London.

POLISH CATTLE.

REPORT BY CONSUL RAWIOZ, OF WARSAW.

I beg to acknowledge the receipt of the cattle circular of July 18 last, and in reply to transmit the following report on the condition of the cattle-raising industry in Poland.

The number of the Polish and foreign breeds is exceedingly limited, and in no proportion whatever to the demands of the local stock-breeders. Owing to the cheapness of the local milk and meat products and the competition with the "Steppe" and peasant cattle, the raising of the foreign breeds is entirely neglected.

The purchasing prices of the animals produced by this country are exceedingly variable, in consequence of the striking differences in their sizes and qualities.

A marketable milch cow weighs from 400 to 900 pounds, and sells from 20 to 65 rubles, while the price of an ox weighing from 600 to 1,100 pounds varies from 38 to 110 rubles and above.

The total number of cattle in the Kingdom of Poland amounts to 2,700,000 head, out of which number 700,000 head are in possession of large landed proprietors, while 2,000,000 head belong to the peasantry.

Nearly the whole of the Polish cattle stock is exclusively bred for the milk products to supply the local demands, and only the old and worn out animals are sold to the butchers of villages and smaller towns.

The larger towns and cities of the country supply their demands with cattle drawn chiefly from the "Steppe" governments of Russia.

The city of Warsaw, for instance, consumes annually about 65,000 head of the "Steppe" and only 3,000 head of native cattle, while the whole Kingdom of Poland consumes about 85,000 head of cattle.

Some of the larger landed proprietors draw considerable numbers of oxen from the Russian "Steppe" governments of Volynia, Podolia, and Bessarabia, fatten, and export them to Berlin and Vienna.

As regards the home demands of the dairy products it may be safely stated that hitherto almost everywhere, with the exception of larger towns, they were regulated by the amount of produce.

As a curious fact and illustrating the above, two towns situated in the government of Lubin, namely: Krasnik, 4,000 inhabitants, and Rachow, 1,900 inhabitants, some ten years ago, with 15 per cent. less population, consumed 360 and 120 gallons of fresh milk daily, respectively; at present the former consumes 1,120 gallons and the latter 400 gallons; this cannot be attributed to the increase of welfare, but to the increased production of milk in the vicinity.

The foregoing data have been collected by my order through some competent party, and as far as I compared them with other statements, I find them fully representing the actual state of the cattle-breeding industry in this country.

As to the blank forms sent me, I beg respectfully to express my regrets that I am unable to fill them up, for want of the statistical offices and the prohibition of keeping such offices by private parties.

I inclose five photographs of Polish cattle types.

JOSEPH RAWICZ,
Consul.

UNITED STATES CONSULATE,
Warsaw, November 3, 1883.

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POLISH BULL

Julius Rehn & Co. Lith.



PLATE 250

POLISH COW

Julius Ben & Co. Lith.





POLISH COW

Julius Rosen & Co. Inc.

POLISH BULL.

Julius Benck & Co. Lith.





POLISH HULL

Julius Rosen & Co. Ltd.





PLATE 253

POLISH BULL

Julius P. B. & Co. Lith.

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PLATE 254

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HUNGARY.

MEAT AND DAIRY CATTLE IN HUNGARY.

REPORT BY CONSUL STERNE, OF BUDA-PESTH.

I herewith beg to submit all the general and statistical information which I have been able to obtain in response to the Department's cattle circular of July 18, 1883; at the same time I deem it proper to remark that many of the details of my report have been kindly furnished me by the honorable minister of commerce of Hungary and Mr. Tormay, the director of the veterinary academy of Buda-Pesth.

CATTLE RAISING IN HUNGARY.

As to generalities, I shall begin by stating the results reached in Hungary by the systematic breeding with the cattle native to the state, and also the results reached by the introduction of cattle of foreign breeds.

Though Hungary has been making great efforts in the last decade to throw off its purely agricultural character, it retains such to a great extent at this day. Like that of few other European countries, her land is more generally adapted to agriculture and her people are by long-acquired habits more inclined to the occupation of farming.

Thus also the raising of cattle was always an industry of great importance to the state, only exceeded by that of grain production. The great competition, however, in late years, by other countries, has made grain-raising so unprofitable that, also considering the favorable results reached in other countries by stock-raising, the people have found it proper to turn their attention more in this direction, and though it is only recently comparatively that systematic efforts have been made, I think the state has already cause to congratulate itself on the results secured thus far.

HUNGARIAN MEAT AND WORK CATTLE.

It being natural that the native cattle is best adapted to the country of its home, much attention has been given to improve and perfect the home race, and this has resulted so successfully that the Hungarian cattle may already be considered very superior animals, especially for the butcher and heavy work. For these purposes there have therefore been very few experiments made in the introduction of animals of foreign race.

CROSS BREEDS FOR DAIRYING.

Of late, however, it has appeared that "dairy farming" is the more profitable branch of stock-raising. The country is therefore making its experiments and applying the results of these more in this direction. Though the experiments with foreign breeds have not been generally satisfactory, there have been a few which have resulted so well that

for dairy farming these have already been accepted as standard stock, and they no doubt will soon largely replace the native cattle for the purpose, though these cannot be called unprofitable dairy animals either.

The most satisfactory of these experiments have been had with the cattle from the Alps (Switzerland and the Tyrol), and these are already practically bred in the north and west of Hungary, also on the eastern border on the higher situated pastures of the Karpathian Mountains and their valleys. Of the the above the "Red Spotted" (the "Pizsgauer" race) and the "Brown cattle" (the race "Brachiceros") deserve to be specially mentioned.

Positively bad results have been made with the cattle from Holland and Oldenburg and those from the northwest coast of the continent generally.

STATE ENCOURAGEMENT OF CATTLE-BREEDING.

In this work for improvement the people are greatly assisted by the government of the state, not only by very instructive and commendable methods of instruction, but also by financial aid where such is needed; there are other privileges granted as a further stimulant to those who will be guided by the system adopted.

To go into details: The state has been divided into breeding districts, in each of which model farms have been established, mostly on lands belonging to the Crown. These farms are managed and held either by the state authorities or by the wealthy gentry, some of whom show exceptional energy and enterprise in this field. They are stocked with the best breeding stock suitable to the locality, either of the native or foreign races.

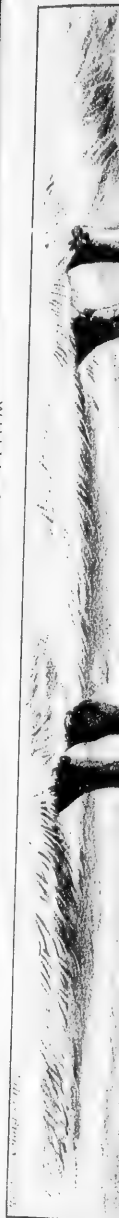
From these centers the individual farmers or breeders, and also village consumers, are supplied with breeding animals on very favorable terms of payment, upon the condition that the progeny be placed at the disposal of the mother establishment for further sale and distribution. Thus the state is being stocked only with such animals as have proven by experiment and practice to be best adapted not only to the country at large but also to the separate districts, and in the same proportion mongrel, defective breeds are gradually being extinguished. In a short time seventy-six such model farms have been created, one of which alone contains four hundred native bulls. With such a system it can be reasonably expected that soon a complete change can be brought about in the direction proving to be the most practical.

THE WHITE CATTLE OF HUNGARY.

There are two races of cattle in Hungary which can be called native; the so-called "White cattle" and the "Buffalo." Of these two the former seems to be very well adapted for domestication in the United States and becoming thus of special interest. I shall here give a short sketch of the animal as far as my limited knowledge of the subject in its technicalities will safely permit me to venture. I hope, however, the people of the United States may be able to draw practical conclusions from this sketch, the foregoing generalities, and the statistical results accompanying my report.

I herewith transmit two photographs of Hungarian cattle, "the White native," referred to at length in my previous dispatch. I think these pictures are very fine ones.

WHITE NATIVE HUNGARIAN BULL



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WHITE NATIVE HUNGARIAN COW

Salus Bond 10.11.14



WHITE NATIVE HUNGARIAN COW



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The horns of the cow are exceptionally short.

As a race the "White cattle" belong to the group "*Bos taurus primigenius*," commonly called "Podolian" and it exists more particularly in Eastern Europe. Although the animal here in Hungary is not considered quite perfect as yet, it is claimed that, of the race, those here have thus far reached the highest state of perfection, and the systematic breeding applied will no doubt soon develop the perfect animal.

Meat and labor qualities.—The qualities mainly recommending it are two; capacity for fattening and the quantity and quality of meat produced, and their great usefulness as working animals. The latter quality makes them especially valuable here where the ox is the principal motor, and I think that this should equally recommend them to the "Far West" of the United States, where the breaking up of the new soil makes the steady, heavy work of the ox more practical than the light, quick work of the horse. As a sample I am informed that a pair of oxen will easily plow about $1\frac{1}{2}$ acres of land 6 inches deep per day. As to their fattening capacity I must add the caution that the animal does not mature as rapidly as that of some other races.

The "White cattle" is raised in all parts of Hungary, since it prospers on every class of soil; the poor sandy, the peat and clay, or the richest alluvial. For localities at an elevation of more than 3,500 feet above sea-level the animal is not adapted. It is, therefore, found more particularly where grain production is practiced, thus enabling it to be made useful as a draft animal, while being also near the distilleries for fattening.

Description.—In the physical description accompanying this report the good average animal is spoken of.

The color is a silvery white or gray, with black mouth and nostrils, and the tail ending in a long black tassel. Animals of a pure white color with a pinky mouth are found occasionally, but these are not popular owing to their sensitiveness to the influence of the weather. The head is small, the line of the forehead straight and covered with a more or less thick and soft tuft of hair; the nose is slightly rounded. The head of the bull is more massive, with coarser outlines, the hair a little darker and more inclined to curl.

The immense and beautiful horns grow a little horizontal from the sides of the head before they curve up and outward; many specimens over a meter in length are found, those a yard long being quite common. Perfection in the correct shape of the horns is highly valued, this being one of the signs of purity of race. Besides the horns have a commercial value as a substitute for whalebone, and, when properly mounted, make beautiful articles of decoration. Altogether the head gives the animal quite a noble, majestic appearance.

The eyes face rather outwardly, are very large, black, almond-shaped, lively, and frequently more fiery than desired.

The ears are firm, reasonably hairy, and point sidewise, not drooping.

The neck is broad, carried high, and is from 10 to 15 per cent. longer than the head, measuring each from the line of the forehead.

The back is long, broad, and very muscular, sway-backed or otherwise poorly shaped animals being rarely met with; the croup is broad and strong; the tail is also strong.

The sides of the beast are broad, long, and deep, in consequence of which the chests have extra large dimensions, which, with their very capable lungs, cause the animal to be so specially well adapted as draft animals.

The withers are long and broad; also the loins, though these are sometimes found longer than they should properly be.

The limbs are very strong and firm; the shoulder muscular, finely shaped, and compact; the forearm is flat, very broad, and covered with visible muscles; the knee is broad; the shin short without coarse bones; the sinews clearly defined; the fetlock very shapely and in good proportion, and the hoofs so strong and firm that it becomes necessary to shoe working animals only on the roughest roads.

Measurement and weight.—The following is a detail measurement of good average animals:

Description.	Meters.	
	Bull.	Cow.
Length of head.....	55	54.3
Breadth of head, widest part.....	25.2	24.3
Breadth of head, narrowest part.....	22.3	19.5
Length of neck.....	61	62
Length of back to point of last rib.....	65	61
Total length from line of forehead to point of "ilium".....	224	218
Height at withers.....	154	150
Girth measure.....	212	191
Breadth of hips.....	54	55
Total length, as above, of extra animals.....	245	257
Total height, as above, of extra animals.....	157	156
Total girth measure, as above, of extra animals.....	224	212
Weight of medium animals..... pounds..	1,381	1,214
Weight of extra animals..... do.....	1,812	1,480

Fattening qualities.—As to their capacity for fattening, it may serve as a sample that a certain herd of seven hundred and forty-two old, long-worked oxen were brought in one hundred and eighteen days of fattening from an average weight of 1,260 pounds to 1,565 pounds. Younger animals have been known to gain as much as 3.54 pounds per day in distilleries, and equally good results have been secured with first-class farm feeding. In short, it is claimed, after many tests, that no race of cattle will compare with this one in the results of systematic fattening.

Dairy qualities.—I am informed, as to their quality for the dairy, that, in more favorable localities much better results have been reached than those stated in the statistical table herewith; that these showings allude only to medium animals under medium circumstances.

Price.—In price they range as follows: Bulls of medium to first-class quality are worth from \$80 to \$120 for three-year olds, and from \$60 to \$100 for two-year-olds; exceptionally fine animals, of course, in proportion more. Cows are worth from \$32 to \$60; year-old calves of either sex from \$20 to \$40. Upon application I can furnish the addresses of breeders of the more thoroughbred herds.

THE HUNGARIAN BUFFALO CATTLE.

I have not been able to obtain an accurate description of the other race of native cattle of Hungary, the "Buffalo," but from my personal observation and information I can say the following:

The Buffalo is a black, shaggy, uncouth-looking animal, with rather horizontally lying head, backward drooping, short, and heavy horns; it is far more docile than its appearance would indicate, and on account of several of its traits it might justly be called the mule of Hungary. Its extreme toughness and, if I may call it so, its modesty in require-

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ment of food and care, are its most remarkable qualities. It is therefore specially popular in localities where food is neither plenty nor good, and everywhere it receives the treatment of a "step-child" in this respect.

It is fond of the water and thrives best in swampy sections, will, in fact, decrease in size if kept in too dry localities. It is a very good work animal where speed is not required, displaying again in this the equanimity of the mule. The milk is noted for its richness.

The Buffalo is raised, in numbers of any consequence, only on the low bottom lands of the Danube, the Theiss, and the Drave, all these districts being noted for their dampness. For the same reason I think he could be practically introduced in the southern portions of the United States; in Florida, for instance, where, as it is, the domestic cattle do not thrive so well.

There are also a few herds of thoroughbred Buffaloes kept up here with the object of maintaining the quality of the race. First class specimens can be had for from \$50 to \$100.

HOUSING AND FEEDING.

The usual manner of keeping the cattle here is as follows:

In summer they are allowed the run of the fields; these not being fenced, the animals are in charge of herders, large herds being under professional herders, while the women or children look after the animals of the smaller farmers.

In winter the small farmers keep their stock in stables. The large herds are kept in sheds, which are protected towards the north, while the south sides are open to allow the animals the run of the adjoining paddocks during day-time; sometimes they are kept altogether unprotected during winter, since the animal can easily stand 44° F. below zero. But all have to be fed during winter, Hungary seemingly not having those grasses from which, as in our "Far West," cattle can make their own living during winter. The small farmer feeds cut feed, while the large herds receive straw, corn-stalks, a little corn, and poor hay.

BREEDING IN HUNGARY.

Inbreeding is never deviated from, crosses being altogether disqualified as breeding stock.

The bull is permitted to run with the herd in March, remaining with it three or four months. Calves begin to be dropped in January, and it is claimed that those which are dropped on the snow are the hardest and best.

Breeding begins with the third year, the bull being considered fully capable until his ninth, and the cow until her thirteenth, year.

Working cattle are broken in at four, and remain fully fit for work during eight, years.

For fattening they are considered ripe at four, but are at their best when seven, years old.

HUNGARIAN BUTTER AND CHEESE MAKING.

The country consumes much milk and sweet cream, not so much butter being used for the table as in the United States. The people are very exacting as to the quality of these things, and use only sweet

Bull.	Cow.
55	54.3
25.2	24.5
22.8	18.5
61	62
65	67
224	218
154	150
212	191
54	55
245	227
157	156
224	212
391	1,214
812	1,480

butter. Lately the system of making butter from sweet milk by separators is becoming quite popular. Cheese is made after the method of Holland and Switzerland, the fat, half fat, and the cream sorts. I have not seen any cheese here of the character of our "Western Reserve" brand.

CATTLE CENSUS OF HUNGARY.

The proportion of cattle raised for the butcher and the dairy will be seen in the following statements, the natives being raised principally for the butcher, and the Red Spotted and the Brown nearly altogether for the dairy.

The census of 1881 showed:

	Per cent.
Native White cattle	60
Red Spotted	20
Brown cattle	16
Buffalo and crosses	10
	100

The following were the numbers of each and of all:

Native:	
Bulls	31,702
Cows	1,535,960
Young cattle	1,463,132
Oxen	1,033,720
Total	4,064,514
Red Spotted and Brown:	
Bulls	14,732
Cows	489,257
Young stock	404,124
Oxen	119,671
Total Red Spotted and Brown	1,037,774
Oxen of different races in fattening	115,286
Buffaloes	93,604
Grand total in census of 1881	5,311,378
Grand total in census of 1871	5,279,193
Increase in ten years	32,185

This seems to be and is, in fact, a very small increase for such a period in a country which is so well adapted for cattle raising, and to whose interest it is as much as I have pointed out. I believe, however, that the next census will show far more satisfactory results, since the systematic efforts have been begun only at the end of the last decade; but what is of more value, the results as to quality and the profits in consequence will prove undoubtedly more satisfactory.

I am informed that the larger proportion of the above increase has been made in the dairy branch, and it is anticipated that this interest will nearly double in a few years.

IMPORTS OF CATTLE INTO HUNGARY.

Hungary is able to raise and is raising all the cattle needed at home for any purpose, and produces a surplus in cattle for the butcher. In consequence, there is nothing imported but the animals for breeding purposes, and these, as I have shown, come nearly altogether from the

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Tyrol and Switzerland. Besides this, the territory is usually barred against the countries to the south and east, Servia and Roumania, which are the only states also having a practical surplus. This prohibition is in consequence of certain cattle diseases frequently occurring there.

IMPORTS OF CANNED BEEF FROM THE UNITED STATES.

Specially from the United States the only article imported connected with this branch is canned beef but this in such small quantities that it hardly deserves being recorded, and I do not anticipate that the import from the United States will assume larger proportions or be of any other character.

EXPORTS OF HUNGARIAN MEATS AND MEAT CATTLE.

The export of the surplus of Hungary meets with similar difficulties in the direction of Germany as that of the United States, experiences with the products of swine. Germany seems to be as much afraid of Hungarian cattle diseases as of the "dreaded American trichinae." Shipments of live cattle to Germany are therefore prohibited. The only practical outlet is Austria and its provinces; but to show how "protection" is becoming the "parole" all over Europe, I may mention that though perfect free trade exists within Austria-Hungary, both being within one and the same customs district, the former state has lately made quite a serious attempt to exclude the cattle of the latter; the attempt, however, has failed, and I will therefore not go further into the details of it.

Italy is open to Hungarian cattle and beef, but seems to find them too good or too dear for her demands.

Repeated efforts have been made to export dressed beef in refrigerator cars to France (Paris), but the obstructions and difficulties proved too great and the ventures failed. For veterinary, sanitary reasons (?) Germany would not allow dressed beef to pass through its territory (somewhat as she objects of late to American pork passing through in transit). The beef therefore had to be taken by the roundabout way through Northern Italy, which proved too tedious, and I suppose too expensive to make the undertaking practical or profitable. During the coming summer the new Arlberg tunnel route will be opened, and this, it is hoped, will give a more direct route to France and, at the same time, make Switzerland a possible field of export.

Hungary and Austria, belonging as stated to one and the same customs district, there is no official statistics kept of the interstate trade, the exact number of cattle shipped from the one to the other is therefore not known. The railroads show that during 1883 there were 183,000 head of cattle shipped from Hungary to Austria; nearly half of this number went to Vienna alone. Of course, many were taken across the border on foot, but there is no record of these. Many of the cattle thus taken to Austria, outside of the larger cities, are work-oxen, a good pair of such being worth about \$200 to \$220.

HEALTHINESS OF HUNGARIAN CATTLE.

The cattle of the Hungarian race are peculiarly free from disease, and the experience of many years has proven more particularly that the oriental cattle plague, though it is at home at no great distance to

the south and east of Hungary, never occurs spontaneously amongst the Hungarian cattle. Serious losses to large herds never occur here, like those frequently caused in other countries by lung and other diseases.

The "autrax" and "trematic affections" are the only diseases from which the cattle suffer occasionally, but serious losses never follow in consequence.

COST OF TRANSPORTATION TO THE UNITED STATES.

Buda-Pesth not being a sea-port, made it impracticable for me to gain the information as to the expenses connected with a probable shipment to the United States.

For superintendence of or the looking after such shipment while in transit the expense will not be excessive. Experienced people here would, no doubt, be glad to have such an opportunity to go to the United States cheaply, and would probably be satisfied with the compensation of simply having their passage paid.

ROUTES OF EXPORT TO THE UNITED STATES.

The most practical route to ship, because the most direct, would be via Hamburg or Bremen, but it is a question whether Germany would permit such transportation through its territory. She may, however, be induced to make an exception when it can be shown that such shipment does not mean competition for any of her established fields of export.

Another route would be via Fiume or Trieste on the Adriatic. This, however, would involve an overlong sea-voyage for cattle. There remains the route through Northern Italy to France and one of the latter's sea-ports, or, what would make these still more practical, the route to France via the "Arlberg tunnel" and Switzerland.

OUTLOOK FOR CATTLE-RAISING IN HUNGARY.

In resumption I may give it as my conviction that in the near future Hungary will become a more important factor of Europe in the way of meat and dairy product supplies. Her central position and peculiar adaptation for stock-raising should have made her this long ago; but it is only of late that she has become fully aware of the importance of this interest or industry to the state, not only on account of its higher profitableness but also for other reasons, as I have shown at the beginning of my report.

I must say again, however, not only the people but also the government of the state are working in the most commendable manner towards a practical reconstruction of its resources, and they will no doubt succeed as much as earnest and practical efforts are deserving of success.

HENRY STERNE,
Consul.

UNITED STATES CONSULATE,
Buda-Pesth; April 16, 1884.

Hungarian
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Pinzgau
Marienhe
Buffalo.

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Special statistics concerning cattle in Hungary.

Race.	Height at maturity.			Live-weight at maturity.			Color.
	Cow.	Ox.	Bull.	Cow.	Ox.	Bull.	
	<i>Meters.</i>	<i>Meters.</i>	<i>Meters.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	
Hungarian cattle, "White cattle," "Podolian race."	1.55	1.66	1.55	1,215	*1,260	1,381	Light gray and white.
Red Spotted	1.46	1.53	1.52	1,249	1,392	1,878	Red spotted.
Brown cattle, "Brachiceros"	1.22	1.27	1.28	950	1,105	1,459	Badger-gray colored.
Pinzgauer	1.30	1.55	1.36	990	1,469	1,436	Red-spotted, dark.
Marienhofen	1.43	1.52	1.50	1,171	1,282	1,613	Light cream colored.
Buffalo	1.38	1.45	1.39	1,149	1,304	1,193	Black.

Race.	Weight of meat at maturity.†	Age at maturity.	How long bred purely.	Average quantity of milk per year.‡	Milk contains fat.
	<i>Per cent.</i>	<i>Years.</i>		<i>Gallons.</i>	<i>Per cent.</i>
Hungarian cattle, "White cattle," "Podolian race."	53.8 to 66.6	4	Always	180	7.58
Red Spotted	56.7 to 64.0	2½ to 3	Several centuries.	405 to 517	4.80 to 6.41
Brown cattle, "Brachiceros"	53.2 64.8	3 3½	Always.	440 550	3.35 4.66
Pinzgauer	52.0 60.9	3 3½	Since 1740	380 495	3.89 6.11
Marienhofen	53.3 62.5	2 3	Since 1728	334 404	3.61 4.48
Buffalo	51.0 59.0	4	Always	190 214	

Race.	Milk contains cheese fat.	Total result of the products.					Remarks.
		Labor.	Net meat §	Milk ||	Butter.	Cheese.	
	<i>Pr.ct.</i>	<i>Yrs.</i>	<i>Pr.ct.</i>	<i>Galls.</i>	<i>Pounds.</i>	<i>Lbs.</i>	
Hungarian cattle, "White cattle," "Podolian race."	5.63	8	60.2	180	133	212	Description in text.
Red Spotted	4.35	3	60.3	460	208 to 247	442	Long, deep, heavy cattle with coarse bones.
Brown cattle, "Brachiceros"	3.81	4	59.0	494	195 221	442	Strong but not coarse bones.
Pinzgauer	4.17	4	57.0	438	182 206	347	Strong bones, and choice as to quality of food.
Marienhofen	4.18	3½	57.9	369	144	217	Tender animals, producing very heavy oxen.
Buffalo		7	54.0	208			Description in text.

* In working condition.

† Percentage of gross weight, including some tallow in the outside weights, the inside weights for unfattened, good-conditioned animals.

‡ Calculated for three hundred days of milking.

§ Net weight of meat by per cent. from gross weight.

|| Supposed total of year of three hundred milking days.

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CATTLE AND DAIRY FARMING

Special statistics concerning cattle in Hungary—Continued.

No.	Origin of the race.	Conditions of temperature.				Sorts of grasses, &c.		
		Degrees cold in winter.	Degrees heat in summer.	Average temperature for the year.	Number of feet above sea-level.	Clover.	Timothy.	Lucern.
1	Hungarian cattle, native of Hungary.....	{ *14 10	27 83	{ 64 46	300 to 1,500	1	1	1
2	Simmenthaler, native of Switzerland.....	{ *14 10	22½ 82	{ 52 45	500 3,000	1	1	.....
3	Brown cattle, native of Bavaria.....	{ *14½ 11	17½ 71	{ 4 45	400 4,000	1	.....	.....
4	Red Spotted, native of the Tyrol.....	{ *10 5	24 86	{ 53 45	350 4,000	1	1	.....
5	Cream-colored, native of Styria.....	.....	.....	.....	500 1,200	1	1	.....
6	Buffalo, native of Egypt.....	.....	.....	.....	.....	1	1	1

No.	Topography.		Character of the soil.				Substratum.					Remarks.
	Dry or damp.	Flat or hilly.	Alluvial.	Sandy.	Clay.	Peat.	Limestone.	Sandstone.	Granite.	Gravel.	Clay.	
1	Dry.....	Flat and hilly ..	1	1	1		1	1		1	1	Does not do so well on granite. Does best where indicated "1." Practical for high locations. Does specially well on chalky soil. Results obtained not so favorable.
2	Damp.....	Mountainous ..	1	.....	1	.....	1	.....	.....	.....	1	
3	do	do .....	.....	.....	1	1	1	.....	1	.....	.....	
4	do	do .....	.....	.....	1	1	1	.....	1	.....	1	
5	do	Hilly	1	.....	1	.....	.....	.....	.....	.....	1	
6	Damp and dry..	Flat and hilly...	1	.....	1	.....	.....	.....	.....	.....	1	

* Reaumur.

† Fahrenheit.

Best results have been reached where marked "1."

Detailed weights of the different parts of animals of the Hungarian race of cattle.

Parts.	Cow.		Medium conditioned ox.		Large well-fattened ox.	
	Pounds.	Per cent.	Pounds.	Per cent.	Pounds.	Per cent.
Live weight	784	.....	1,160	.....	1,774	.....
Skin and horns	56	7.18	88	7.61	104	5.85
Blood saved	33	4.22	38	3.23	42	2.40
Stomach and contents	81	10.38	191	16.47	197	10.80
Udder with contents	80	10.14	.....	.....	.....	.....
Feet and mouth	14	1.80	21	1.80	24	1.37
Tallow	64	8.15	106	9.17	212	11.96
Fore-quarter with one-half head	62	8.12	105	9.09	212	11.95
Hind-quarter	96	12.52	147	12.66	239	13.54
Remaining two quarters	159	20.00	252	21.90	451	25.00
Breast	48	6.05	75	6.47	140	7.90
Heart, liver, kidneys, spleen, and tongue	27	3.38	38	3.23	51	2.91
Loss by blood, &c.	26	3.36	35	2.85	33	1.86
Entrails and lung	38	4.78	64	5.52	69	3.86
Total sum	784	100.00	1,160	100.00	1,774	100.00

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DOMINION OF CANADA.

PROVINCE OF ONTARIO.

OPERATIONS OF CANADIAN CATTLE COMPANIES IN THE UNITED STATES.

REPORT BY CONSUL PARKER, OF SHERBROOKE.

The Cochrane Cattle Company, of which Hon. Mr. Cochrane, of the Hill Hurst Farm, Compton, is the president, owns very extensive grass lands near the Rocky Mountains in the British Northwest, where the company is breeding and grazing large numbers of cattle. With these herds the managers are now using Polled Angus and Hereford bulls to produce the best crosses with the native stock, and grades of Shorthorn and native parentage, which constitute the base of the herds. Experience has established it as a fact, they think, that the grade cattle produced by this crossing of the Aberdeens and Herefords with the rank and file of the herds, endure the rigors of the climate better and fatten more easily than any grades that they have been heretofore able to secure. The Dominion Cattle Company now has a lease from the Cherokee Indians of 284,000 acres of pasture lands, and also of a large body of land near the former in the Pan Handle of Texas. Upon these lands the company has located forty thousand head of cattle, mostly grades of native Texas and Shorthorn parentage, and not a few of them the children of second crossings of these grades with Shorthorn sires. The managers say that this continued crossing of grades of Shorthorn and Texan extraction with Shorthorns produces coarseness and legginess to an extent that renders the cattle harder to fatten and slower to mature. That, in short, the third or fourth generations produced by that kind of crossing will not become sufficiently fat for butcher's use upon grass alone, and that herdsmen who have followed that line of crossing persistently are now only able to sell cattle to the feeders. To correct this tendency Polled Angus and Hereford bulls have been introduced, and the results in the herds of the Dominion Cattle Company give promise of being highly satisfactory.

The methods of this company are perhaps worthy of a short digression from the main subject in hand. It occupies a breeding farm of 7,000 acres, near Emporia, Kans., which is used not only to breed the best lines of pure blooded cattle, but also to thoroughly acclimate imported stock before it is sent forward to the herds. To this farm the thoroughbred stock from Cookshire and other Canadian breeding establishments, and the imported cattle from Scotland and England, after coming from the ninety days' quarantine at Point Levi, are sent in the autumn, and remaining there over winter, are supplied to the herds in the spring. Thus an effectual quarantine of seven to eight months is provided against the possibility of sending diseased animals to the herds. For first crosses with native cattle in the West and South nothing is superior to the Shorthorns. But for additional crosses the hardihood, compactness, and beefiness of the Aberdeens and Herefords greatly commend

Sorts of grasses,
&c.

Clover.	Timothy.	Lucern.
1	1	1
1	1	
1		
1	1	
1	1	
1	1	1

Remarks.

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Per cent.
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2.40
10.80
1.37
11.06
15.05
19.54
25.00
7.90
2.61
1.86
8.86
100.00

them. Another point in their favor is that they are what herdsmen call "good rustlers;" that is to say that they are active feeders and will find the grasses and assimilate them with a readiness that makes them superior for grazing cattle to most other breeds.

The growing favor with which these cattle are received by breeders in the United States indicates that they regard them much in the same light in which they are looked upon by the Canadian breeders. Sales were made during the past fall from two eastern township herds. One by Mr. Cochrane, in Chicago, from the Hill Hurst Farm herd, of sixty Polled Angus bulls and heifers, all of which brought prices that appear almost extravagant, and the other by W. B. Ives from the Cookshire herd. This latter took place in Kansas City, Mo., where forty Polled Angus bulls and heifers were sold at prices which averaged \$540 each.

BENJ. S. PARKER,
Consul.

UNITED STATES CONSULATE,
Sherbrooke, December 19, 1885.

THE MOST SUITABLE CATTLE FOR CANADIAN FARMERS.

REPORT BY COMMERCIAL AGENT ROBBINS, OF OTTAWA.

As indicating the extent of cattle-raising in Ontario, the latest census report shows that there were 160,207 killed or sold during the year 1880, and that there were 23,263 working oxen, 782,243 milch cows, and 896,661 other horned cattle in the province. Many of the better grades of fat cattle are exported to England, and considerable attention is being given to the improvement of stock for this market, whilst most of the stock cattle are marketed in the United States; large numbers going to the sections bordering on the Saint Lawrence. The class exported to the States are mostly of the native or Canadian breed, and with the change of feed and care prove profitable for both beef and dairying purposes.

THE SHORTHORN AND THE HEREFORD.

In 1880, by an order in council, a committee of eighteen prominent citizens of Canada was appointed to investigate the various agricultural interests of Ontario, and was known as the Ontario agricultural commission. A large amount of testimony was taken, especially on the cattle question, and in February 1881, their report was completed. I herewith submit as a part of this report an extract embracing the conclusions arrived at by the commission, as follows:

The evidence obtained as to the qualities of the Polled Angus, more particularly as beefing cattle; the proofs of the success they have achieved in the prize ring, and the estimation in which they are held by the British salesman and butcher, give them the strongest claims to attention by Ontario breeders.

The statements as to the size, weight, and early maturing, as well as extraordinary milking qualities said to belong to the Holsteins, commend them also to closer observation and strict scrutiny.

Coming to the breeds more familiar to the farmers of this province it is clear to every one that for general use, and for the combination of beefing and milking qualities, the Jerseys are not to be thought of. They must be regarded as useful for their own particular and pacific purpose of yielding a copious supply of very rich milk, and as suited exclusively to butter-dairying purposes or for private family use.

The Ayrshires have a far closer relationship to the common cattle or natives than the Jerseys, possibly than any other breeds, although that is an open question. And the Ayrshire bulls may be found of service in maintaining and perpetuating or reviving the functions where they appear to have fallen off or to be declining. The Ayrshires can be brought to a fair size for market, and, some tendency to milk fever excepted, owing to the great activity of their milking functions, are a hardy and thrifty race of cattle. But it is impossible to say that they are the breed to which the general farmer can look for the means of putting his herd on the most profitable and economical footing.

The Galloways have the merit of being good beefing cattle if well fed, and of enduring hard fare if such be their fate. They may, also, from the absence of horns, be a little better adapted for a shipping trade than others. But they take no high place as milkers, unless it be in isolated instances, and in the presence of the Durham and Hereford it is not possible to say they are the breed on which the ordinary farmer should place reliance. There may, however, be situations in so wide a country as Ontario, not to say Canada, where the hardness of the Galloway would make it of value.

The Devons as draft-cattle, and rich if not very copious milkers, may suit those who have special need of animals possessing such qualities, while for the home market they produce meat of a rich and excellent quality; but as a breed to furnish the grade steer or heifer needed by the Ontario shipper they will never, it may safely be predicted, take a high place.

The fact is, that for the object the commissioners have in view, namely, the several combined requirements of the Ontario farmer, the competition for first place lies between the Durham and Hereford alone. Of either of these two noble breeds there are a sufficient number in Ontario to supply the ordinary demand, although the Durhams being the most numerous the opportunity for selection by buyers is greater, and the services of Durham male animals can be as a rule most easily secured.

For attaining a given size and weight in a given time and at the earliest period of its life, always assuming its treatment to be liberal and judicious, the Durham cannot be beaten. The prepotency, too, of the Durham male is universally recognized, and there is enough Durham blood in most of the present farm stock of Canada to make assimilation easy and to secure certain results. By careful selection, too, of bulls from milking families the dairyman may secure in the Durham the means of beefing his cows profitably when needful to do, without diminishing the supply of the milk on which he primarily depends for his profits. The only danger, if there be danger, in the Durham, is that by too close breeding, and perhaps pampering, a delicacy of constitution may be engendered and disseminated. Such a possibility has been hinted at, and while it ought not to tell for one moment against the use of the Durhams at the present time, it makes it all important (1) that no opportunity should be lost of giving the Durham stock in Ontario the benefit of imported blood; (2) that the intelligence and vigilance of breeders and veterinary surgeons should always be on guard against such a possibility; (3) that the knife should be used unsparingly when anything short of the most vigorous constitution is detected, and (4) that all legitimate encouragement should be given to a second breed of cattle capable, approximately, of holding its own against the renowned Shorthorn.

That breed, so far as Ontario is at present concerned is, if the evidence be correct, the Hereford. Strong in its prepotency, all but equal in early maturity in the stall, and more than equal in the pasture to the Durham; with a constitution in which, so far, no trace of or tendency to any weakness has been detected and with good milking qualities, the Hereford may yet prove to be a useful factor in the great work of giving to Ontario a class of cattle adapted to the varied demands of such a country.

THE NATIVE CATTLE OF CANADA.

The foregoing conclusions are based upon a large amount of testimony given by prominent cattle-growers before the commission, and representing all portions of the province. I would also in this connection call attention to the common grade of cattle, which are said to have considerable merit for beefing and dairying purposes.

Prof. W. Brown of the agricultural college at Guelph, in a report to the Agricultural Association of Ontario, in 1882, says:

The Canadian: I know of no class of cattle so well deserving a first-class notice in these pages as the Canadian. There is a distinct type entitled to this name. I do not mean those with a touch of the Ayrshire, Devon, or any others, not even the Short-horn grade; but that moderate sized, milking, wiry, active stamp well known to the average farmer. I claim that the Canadian deserves more notice than has ever

been given to it, public and specific; given a recognized position that cannot be doubted. Our experience of this breed has been intimate and very satisfactory. We hold by clear and substantial evidence for eight years that the Canadian cow takes no mean place as a milker, a mother, and a field for wide work both for beef and dairy purposes. Much of this is due to her distinct character in more respects than one. She is decidedly content with her average circumstances, miserable as they be at times; can do as well in the bush as in the clover fields, and responds with her best when the thermometer is at zero or 90° in the shade. Her quantity of milk is not so large as the Ayrshire for six weeks after calving, but far ahead in continuance, and therefore on an average equal; in cream it is unquestionably superior to the Ayrshire. No one well acquainted with the breeds would choose the Ayrshire against the Canadian where hardships and profits, under ordinary conditions, were elements; so also in regard to a common source for cheap production of beef with Shorthorn or Hereford bull; other bulls have not as yet been sufficiently tried except the Ayrshire and Devon, which cannot compare with these two. While small as a heifer, the Canadian cow is roomy as a breeder, and this affords field enough for such purpose. I am confident that a proper selection of the milking Canadian would add immensely to the dairy and beefing interests of the country.

It is also in evidence that the farmers of Canada, do not as a rule, take the best of care of their stock. Mr. John Clay jr., a witness before the commission, speaks very strongly on this subject, he says:

I believe my remark about the farmers badly housing and feeding their cattle in the winter applies generally to farmers in Canada. Their buildings are as a rule drafty and cold, and the amount of food they give to their cattle is not enough to keep up their frames. This practice is very general throughout Canada. Although you will find some of our farmers who keep their cattle in very good condition, I believe the percentage of farmers in Canada who neglect the proper feeding and housing of their cattle is fully 60 per cent.

R. B. ROBBINS,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Ottawa, October 3, 1885.

CATTLE AND DAIRY FARMING IN ONTARIO.

REPORT OF CONSUL PACE, OF PORT SAENIA.

THE NATIVE CATTLE BRED OUT.

In compliance with Department circular, under date of July 18, 1883, I send herewith such information as I have been able to obtain (by actual observation and otherwise) touching the breeding of cattle in Canada. For a number of years back the Canadian farmer has shown commendable zeal and much good judgment in the direction of the improvement of his cattle. By crossing the native cattle with imported breeds from Europe the old style of ox and cow have nearly disappeared from the pastures, the distinctive features of the Shorthorn, the Galloway, the Hereford, the Ayrshire, and other breeds are clearly observable in the various farm-yards of Ontario, and in many sections of this province purely native cattle would be regarded as a curiosity.

CANADIAN POLLED ANGUS CATTLE.

On the 30th of October last I visited the stock farm of the Messrs. Geary Bros., near London, and through the courtesy of Mr. John Geary I was shown the splendid herd of Polled Angus cattle owned by his firm. I saw in one inclosure, arranged in such a manner as to be seen

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from every part of the building, one hundred head of these peculiar cattle, some of which were imported direct from Scotland by the Messrs. Geary, and others were bred from imported stock on the farm where I saw them. In color they are intensely black; they have no horns, are short-legged, heavy-bodied, with small bone, and in appearance they were very healthy. They are good feeders and very docile and hardy. I am informed that when a number of these cattle are turned out to pasture, that they do not scatter over the field as do other breeds, but are usually found feeding close together like geese or sheep. The beef from the Polled Angus ox is said to be of excellent flavor, and the different layers of lean and fat are distributed in such a manner as to resemble variegated marble, and in the market it is frequently designated as marble beef. From careful inquiry in relation to the characteristics of this breed of cattle, I am convinced that they would be a source of profit to the farmers of our Northern and Middle States; of one thing I am certain, the animals of this breed are in appearance much improved by the transition from Scotland to Canada, or rather, the animals bred in Canada from imported Polled Angus stock are superior in size and general appearance to the cattle from which they were bred. Some fine specimens of this stock were recently sent from the farm of Geary Bros. to Kansas, and Mr. John Geary informed me that he frequently receives orders by mail from various points in the United States for animals of certain weight and other characteristics to suit the purchaser, and he volunteered a compliment to the American buyer by the remark that in filling these orders, as he invariably did (he possessed suitable stock for the purpose), he had always received a ready response by way of draft or otherwise from the purchaser in full payment as soon as the animal had reached its destination.

The following extract in reference to the Polled Angus I take from the report of the Ontario agricultural commission for 1881:

The victories won by the Polled Aberdeens in the prize ring would be too numerous to recapitulate here. Suffice it to say it was a Polled Angus bullock that carried off Prince Albert's cup at Poissy in 1862, the competition being between all the breeders of the world; that a Polled Angus yearling bull won the gold medal of his class, at Paris, in 1878; that a Polled Angus has repeatedly gained the chief prizes at Birmingham, and carried off the champion cup on at least three occasions at the Christmas cattle-show in London, the last of these triumphs being at the show for 1880. The Tillyfour herd now exists no longer. On the 26th of last August it was sold by auction and dispersed. The accompanying plate supplies a very excellent illustration of the Polled Angus breed, of which some very fine animals are to be seen at the agricultural and model farm at Guelph.

Professor Brown says of these Aberdeen Polled cattle:

I am very well acquainted with the Aberdeen Polled, and it is well known that for early maturing it is equal to the Shorthorn, though not so far as our experience goes equal to it in improving other breeds or in attaining a greater weight in a certain time. At the present time we may call them our second best beefing breed.

But in the eye of the British buyer of fat cattle Polled Angus does not rank second even to the great Shorthorn. Mr. Hall, in his evidence, says:

Of the cattle which come into the English market those which rank highest in point of quality are the Aberdeen Scot. They are the breed known as the Polled Angus. The fat Galloway ranks about equal with the Polled Angus; but a middling Galloway is just about as bad a bullock for a butcher as you can select; he kills very coarse indeed. The Galloway will bring more per pound than any other breed, except the Aberdeen, but he does not cut as streaky as the Polled Angus. * * * Next to the Polled Angus or Scot in point of quality I put the English Shorthorn or Durham.

Mr. Hall adds further on:

For the purpose of getting good grades I would recommend your farmers to cross your native cattle with Shorthorn, and only to cross once. I would also recommend the Polled Angus as an animal for improving your stock; I think the Polled Angus crossed with the Shorthorn would give you an excellent animal for the butchers—that is, one cross. I would take a thoroughbred Shorthorn cow and cross her with a Polled Angus bull. I would also cross the Polled Angus with your native cows. I do not think thoroughbred steers sent over to England would fetch any more than other cattle. Whether you would succeed in making anything better than a Shorthorn I would not venture to say, because you have sent some extraordinary cattle into England.

The evident merit of the Polled Angus breed (writes the secretary of the Ontario agricultural commission) has induced the commissioners to notice them quite fully. One writer says, with reference to crossing the Polled Angus with the Shorthorn:

It is probable that the size of the Shorthorn would be somewhat reduced, which might not be a disadvantage, but his quality would not be impaired; indeed there can hardly be a doubt that the quality of the meat would be improved. On this point, however, we are not left to reason or conjecture, for the cross has been tried with most happy results. A distinguished Scotch authority says: "Of all the varieties of cross-bred cattle there is none more satisfactory or remunerative than the Polled Angus, or Aberdeen, and the Shorthorn. It grows to a large size, shows great aptitude to fatten, and when killed the fat and lean are found to be distributed throughout in the most desirable proportions."

My object in making special mention in the present report to the Polled Angus breed is to call the attention of the American stock-breeder to a breed of cattle having many excellent qualities, and a breed, too (as compared with many other kinds and qualities of cattle), of which but little is known.

NUMBER AND BREEDS OF BLOODED CATTLE IN ONTARIO.

By reference to the following table it will be observed that for the year ending May 31, 1882 (which is the last available information upon this point), there were but two hundred and seventy head of Polled Angus cattle in this province:

Number of each class of thoroughbred cattle in Ontario, by county municipalities, as returned May 31, 1882.

Counties.	Thoroughbred cattle.					
	Durham.	Devon.	Hereford.	Polled Angus.	Galloway.	Ayrshire.
						Total.
Essex	246	34	33	25	17	434
Kent	391	32	41	1	70	550
Elgin	321	67	13	19	48	498
Norfolk	433	60	46	5	50	724
Haldimand	394	23	16	—	40	490
Welland	190	—	9	3	14	281
Lambton	488	71	8	5	34	660
Huron	688	60	36	23	54	883
Bruce	496	33	32	6	51	678
Grey	507	42	35	8	41	794
Simcoe	587	51	28	7	65	1,468
Middlesex	1,111	151	50	14	84	1,513
Oxford	618	51	19	5	24	913
Brant	591	8	3	—	10	628
Perth	433	30	7	10	23	551
Wellington	1,125	36	125	9	77	1,424
Waterloo	670	13	18	6	5	734
Dufferin	189	8	7	9	12	184
Lincoln	272	24	5	—	84	340
Wentworth	316	30	10	2	119	488
Halden	429	37	1	1	49	529

Number of each class of thoroughbred cattle in Ontario, &c.—Continued.

Counties.	Thoroughbred cattle.						
	Durham.	Devon.	Hereford.	Polled Angus.	Galloway.	Ayrshire.	Total.
Peel.....	462	86	11	.....	26	20	552
York.....	741	27	22	4	27	127	948
Ontario.....	707	83	0	.....	24	17	847
Durham.....	457	52	21	6	35	88	659
Northumberland.....	328	45	12	4	28	121	538
Prince Edward.....	142	19	14	1	32	173	575
Lennox and Addington.....	161	20	2	2	25	117	329
Frontenac.....	158	7	10	6	31	123	345
Leeds and Grenville.....	280	18	17	7	32	545	908
Dundas.....	106	17	22	5	30	263	452
Stormont.....	85	23	8	9	15	307	447
Glengarry.....	139	20	40	6	0	293	501
Prescott.....	80	5	25	5	5	202	329
Russell.....	69	5	2	4	2	70	161
Carleton.....	127	16	11	2	26	199	321
Renfrew.....	70	0	1	.....	10	83	164
Lanark.....	109	2	5	10	21	140	287
Victoria.....	193	55	13	2	12	31	306
Peterborough.....	173	46	37	2	83	86	427
Haliburton.....	15	5	.....	2	4	5	29
Hastings.....	170	48	16	27	27	202	406
Algoma.....	17	1	1	.....	2	5	26
Muskoka.....	38	20	3	1	4	.....	68
Parry Sound.....	25	4	.....	7	2	2	40
Total.....	15,385	1,438	841	270	1,189	4,496	23,619

MILKING QUALITIES OF THE POLLED ANGUS.

With regard to the milking qualities of the Polled Angus, my observation does not lead me to speak authoritatively. On this point I may quote Lord Airlie, of Scotland, the owner of a herd of Polled Angus cattle. In his reply to a writer in North British Agriculturist he says:

I observe that the writer of the article states that the Polled Angus cows are bad milkers. It is the fashion to say so; and no doubt, if you breed exclusively for show-yard purposes and for beef producing, you may have a number of indifferent milkers. The same might probably be said of any herd, certainly of the Shorthorns. But if you want dairy cows, and select the right animals, you will have nothing to complain of.

He further says:

I have at present seventeen Polled Angus cows in my dairy. The greater number of these give from 12 to 14, and sometimes 16 Scotch pints for a considerable time after calving.

The milk is admitted to be much richer than that of either the Short-horn or Ayrshire. As regards the length of time for which they will continue to give milk, Lord Airlie says:

My cow, Belle of Airlie (1959), dam of Belus (749), as pure a Polled Angus as any in the herd-book, used to be milked all the year round.

TRANSPORTATION OF STOCK TO THE UNITED STATES.

By a glance at the map of Ontario, it will be seen that nearly every township in the province is in close proximity to a railroad. The Grand Trunk and Canada Southern with their numerous branches, furnish excellent means for the transportation of stock. These roads connect at both the eastern and western frontiers of Ontario with the various American lines which lead to every State and Territory of the United States. Of course the cost of transportation depends upon the distance.

The rate per mile for both freight and passengers by Canadian railways is about the same as that charged by the railroads in the United States. The competing lines of railway in this province may be regarded as a sufficient guarantee against an overcharge in the item of freight.

FEEDING AND HOUSING CATTLE IN ONTARIO.

As to housing cattle, all stock breeders agree in recommending warm and well ventilated stables. There are different kinds of stables, but the most convenient method appears to locate the stalls in a large and roomy stone basement. The cattle are usually tied with chains fastened to a collar of leather which encircles the neck, the animals facing each other with an alleyway between them. Corn fodder, or green unmatured corn stalks, is a favorite food for cows, and is freely fed to milk cows during the last weeks of July and the month of August. This food, it is claimed, keeps up a steady flow of milk and keeps the animal in good condition. Canadian farmers cut their hay earlier than formerly, as they say grass allowed to shrivel and bleach in the sun and rain loses much of its nourishment; hay, to retain its sweetness, must be cut early and dried quickly in the sun.

CHEESE MAKING IN ONTARIO.

Previous to the year 1864 factory cheese-making had not been known in Canada. At about the date mentioned (as I learn from the report of the Ontario agricultural commission, Mr. Harry Farrington, of Herkimer County, New York, settled in Oxford County, Ontario. Mr. Farrington commenced the manufacture of cheese as he had previously done in New York State, and, to use the language of Mr. Ballantyne (a witness before the commission above referred to), "a deep debt of gratitude is due to Mr. Farrington for having established this new and thriving industry in Canada." To show the growth of this industry, I may be permitted to refer to the following figures: In 1857, 1858, and 1859, the exports of cheese from Canada to the United States—the reciprocity treaty being then in force—was 124 cwts., 117 cwts., and 323 cwts., respectively; in 1860, 1863, and 1864, 1,110 cwts., 466 cwts., and 1,138 cwts. The highest money value of cheese exports in any of the above years was \$16,199. In 1879 and 1880, the exports of cheese from Canada amounted to no less than 43,441,112 pounds, the declared value being \$4,094,046, or nearly 10 cents per pound. Of this, 40,368,678 pounds was the produce of Canada; 3,000,000 pounds of American cheese for the same period apparently found its way to a foreign market, through Canadian ports. The following table shows by counties the quantity of milk used, the quantity and value of cheese made, and the quantity of cheese on hand as returned for three hundred and six factories in December, 1882. Also the total number of factories in the province for the same year. It will be seen that whilst the returns show four hundred and seventy-one factories in Ontario, reports were received but from three hundred and six, leaving one hundred and sixty-five factories in the province from which no returns were made for the year 1882:

Kent
Elgin
Norfolk
Hastings
Wellington
Lambton
Huron
Bruce
Simcoe
Middlesex
Oxford
Brant
Perth
Wellington
Waterloo
West
Peel
York
Ontario
Durham
North
Prince
Lennox
Frontenac
Leeds
Dundas
Stornoway
Glengarry
Lamark
Victoria
Peterborough
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County.	Factories.		Milk used.	Cheese made.	Value of cheese.	Cheese on hand.
	Total number.	Number making returns.				
			<i>Pounds.</i>	<i>Pounds.</i>		<i>Pounds.</i>
Kent	12	5	3,954,764	293,570	\$32,070	
Elgin	25	13	12,164,608	1,171,084	125,720	
North	18	4	2,841,510	260,217	28,832	
Haldimand	5	5	3,183,416	318,344	5,917	
Welland	4	3	230,112	23,849	3,090	
Hamilton	12	9	7,806,141	705,401	75,065	
London	16	11	12,322,175	1,190,212	132,110	491
Simcoe	7	4	3,209,506	317,602	34,213	
Middlesex	6	2	325,063	52,500	5,322	
Oxford	25	10	22,088,777	2,191,083	241,180	
Perth	31	15	25,578,004	2,404,035	268,550	
Brant	7	2	1,970,322	191,475	21,712	
Wellington	33	18	24,123,724	1,883,910	209,465	
Waterloo	8	7	5,461,065	570,080	59,250	
Westworth	8	8	6,800,290	639,328	68,529	
Peel	3	3	4,165,804	402,141	40,697	5,486
York	3	2	1,001,204	164,226	17,673	50
Ontario	5	2	350,349	34,142	3,034	
Durham	5	2	644,398	53,812	6,935	
Northumberland	6	4	2,902,802	274,850	30,751	
Prince Edward	19	13	12,423,333	1,228,754	133,853	
Lennox and Addington	10	7	3,469,800	612,644	37,320	
Frontenac	10	10	8,454,817	820,295	89,709	
Leeds and Grenville	20	6	3,379,790	349,284	37,397	
Dundas	49	27	19,138,414	1,823,320	197,775	3,722
Stormont	5	4	2,308,646	231,930	24,630	
Glengarry	10	14	9,067,770	910,610	101,650	
Lanark	43	42	19,090,000	2,000,000	300,000	
Victoria	8	5	4,109,440	411,591	43,073	2,220
Peterborough	4	3	2,379,020	234,121	25,454	
Hastings	9	8	5,684,132	558,731	60,202	
Other counties	31	27	24,415,660	2,492,857	271,861	
Total	10	5	3,445,046	341,098	34,976	
Total	471	306	205,813,755	25,502,481	2,767,086	12,342

The proportion of cream to milk from well-fed and well-kept cows of good breed is stated at from 14 to 16 per cent.; this is regarded as an average. When milk is exchanged at the factories for cheese (as is the custom in this country), the amount allowed is 1 pound of cheese for 10 pounds of milk.

TREATMENT OF DAIRY CATTLE.

In reference to the treatment of dairy cattle, I may say that a good, warm, well-ventilated stable, a liberal supply of food, and an abundance of fresh water, are indispensable; coupled with these kindness and gentleness of manner should ever be characteristics of the dairyman. I would urge (even at the risk of being considered sentimental) the practice of forbearance and kindness toward all domestic animals, in the first place because it is right and in the next place because it pays.

CLIMATE OF ONTARIO.

Although I have not been able to obtain such information as would enable me to fill out the forms sent me by the Department having reference to climate and other subjects, yet the annexed table will I trust be of interest as showing the comparative meteorological register for the seven years, 1876 to 1882, as recorded at the Toronto Observatory, in latitude 43° 39' 4" north and longitude 5° 17' 33" west.

Years.	Temperature.							Barometer.				
	Mean.	Difference from average (42 years).	Thermic anomaly (lat. 45° 40').	Highest.	Lowest.	Monthly and annual ranges.	Mean daily range.	Greatest daily range.	Mean height.	Difference from average (41 years).	Highest.	Lowest.
1882	45.42	+1.21	-1.50	80.9	-17.4	107.3	15.70	36.0	29.6515	+0.353	30.447	28.781
1881	46.06	+1.85	-1.40	82.7	-15.1	107.8	16.61	40.9	29.6311	+0.149	30.461	28.911
1880	45.43	+1.22	-1.50	82.9	-15.1	107.8	16.61	40.9	29.6359	+0.197	30.461	28.800
1879	44.16	-0.05	-0.86	80.5	-13.9	104.4	15.11	34.1	29.6353	+0.191	30.319	28.918
1878	47.09	+2.88	-1.93	95.4	-13.9	104.4	15.11	34.1	29.6347	+0.184	30.352	28.607
1877	40.10	+1.89	-1.92	88.8	-13.9	102.6	16.19	33.9	29.6346	+0.146	30.350	28.703
1876	43.98	-0.21	-1.04	92.9	-9.5	102.4	15.68	42.1	29.0017			

Years.	Mean humidity of the air.	Mean elasticity of aqueous vapor.	Cloudiness.		Wind.		
			Mean.	Difference from average (28 years).	Resultant direction.	Resultant velocity.	Difference from average (31 years).
1882	74	0.265			N. 47 W.	0	
1881	75	0.283	0.63	+0.02	N. 50 W.	2.11	+2.86
1880	75	0.280	0.62	+0.01	S. 80 W.	2.70	9.91
1879	70	0.267	0.62	+0.02	N. 72 W.	2.82	10.54
1878	77	0.293	0.63	+0.01	N. 63 W.	3.18	10.36
1877	74	0.275	0.62	-0.01	N. 62 W.	2.25	8.32
1876	76	0.263	0.66	+0.06	N. 51 W.	1.93	9.29

Years.	Rain.			Snow.			Number of fair days.	Number of auroras observed.	Possible to see aurora (number of nights).	Number of thunder storms.	Number of hours sun-shine.	Ratio of possible sun-shine.
	Total amount.	Difference from average (39 years).	Number of days rain.	Total amount.	Difference from average (39 years).	Number of days of snow.						
1882	20.587	-7.518	110	42.5	-27.42	62	209	60	204	28	3,169.5	0.47
1881	21.138	-6.967	123	57.0	-12.32	64	191	23	187	24		
1880	30.922	+2.817	140	44.0	-25.02	78	193	23	108	47		
1879	22.515	-5.500	170	60.5	-1.42	79	188	9	191	37		
1878	43.390	+15.285	132	51.0	-18.92	56	292	7	195	30		
1877	21.885	-6.220	116	37.3	-32.62	54	204	13	206	33		
1876	21.063	-7.042	117	113.4	+45.48	76	186	13	171	19		

VALUE OF WEATHER REPORTS.

Farmers in this country are just beginning to appreciate the weather reports which are bulletined at the various telegraph stations, throughout the province, and this system, which gives with a reasonable degree of correctness information concerning the approach of storms, is particularly valuable during the season of harvest.

SAML D. PAGE,

Consul.

UNITED STATES CONSULATE,
Port Sarnia, November 17, 1883.

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THE CATTLE OF ONTARIO.

REPORT BY CONSUL HOWARD, OF TORONTO.

HOW ONTARIO BECAME POSSESSED OF BLOODED CATTLE.

The province of Ontario was largely settled by sturdy well-to-do farmers from England and Scotland, who brought with them to their new home not only their native, social, and political peculiarities, but also the agricultural axioms and tenets of their fatherland. So that shortly there appeared in Canada a farm, here, that was a transcript, as far as the new locality and the changed conditions would permit, of the Scottish farm and surroundings; a farm there that was, as far as possible, a copy of the one that had been left in England. And in time cattle familiar to the eye of the settler, and of the sort that had been in a generous sense his friend "at home," came to be seen in the new fields and gave evidence not only of their owners' prosperity, but of that inherent sentiment that cherishes old associations—that delightful conservatism that clings to old friends. So the stately Durhams soon dignified the fields of the English emigrant and gladdened his eyes with their magnificent proportions, while the Ayrshire cow filled the Scotch farmer's heart with gladness and his pail with milk. And at one time the character of the herd—whether Durham or Ayrshire, Galloway or Devon—might almost have been determined by the name of the owner. This natural method of selection, if it may be called such, has not been without its lasting benefit. Through it there has been introduced into Canada a much wider variety of cattle than would otherwise have been the case—none of them adapted to all uses, of course, but each race excelling in some desirable quality. In later years national sentiments have ceased to govern cattle-breeding in so large a measure, and to-day cattle are bred for certain known and admitted excellencies, and the breeder selects his herd in accordance with the object in view—as stall feeding, grazing, the dairy, or family use.

THE CANADIAN SHORTHORN.

Of all the different breeds in Canada the one first deserving of notice, both by its superiority in numbers as well as its early introduction into the country, is the Durham, or Shorthorn, as it is much oftener called at the present day. The superiority of this breed of cattle for beef purposes was for many years unquestioned, and might, perhaps, be so still had not the art of Shorthorn breeding been turned from its legitimate line into unscientific and fatal courses. A kind of bucolic dilettanteism sprang up among breeders of this race of cattle, and in the development of family lines the general improvement of the race as a whole was almost entirely lost sight of. Starting undoubtedly with an honest desire on the part of the most skillful of the English breeders to perfect the Shorthorn race of cattle, their very success founded a royal family of Shorthorns so powerful in its influence that it may well be doubted if the *Duchess* family, as a family, have not done Shorthorn breeding more harm than good. The whole result of breeding in the years that followed the death of Mr. Bates, that most conscientious and intelligent of English breeders, was simply to produce and perpetuate a pedigree. Very soon the natural result of such a vicious system was seen in im-

rometer.

Highest.	Lowest.	Monthly and annual ranges.
30.447	28.781	1.666
30.401	28.917	1.550
30.323	28.900	1.523
30.319	28.918	1.371
30.133	28.607	1.516
30.352	28.712	1.640
30.350	28.703	1.647

nd.

Mean velocity (miles per hour).	Difference from average (34 years).
10.42	+1.86
9.91	+1.35
10.54	+1.25
10.36	+1.08
9.88	+0.80
9.32	+0.76
9.29	+0.77
	+1.73

Number of hours sunshine.	Ratio of possible sunshine.
169.5	0.47

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potent bulls, barren cows not able to bring forth even a pedigree, weakened constitution, diminished size, but greater fineness of bone and that "thoroughbred look" that to many eyes compensated for the absence of the best marks of the earlier race and the plebeian families. A pampered life, incestuous breeding, and a disregard of the true idea of development, brought the inevitable result of such a method. Though, fortunately, while the inherited weakness of the "royal family" kept its numbers small, the scarcity kept the prices up, and therefore in two ways prevented the average breeder from the folly of buying a pedigree with a bull "thrown in," and allowed him to go on with the development of his "plain" bred cattle, according to common sense and yet truly scientific principles. I judge the evil, however, to have been less in Canada than in the United States, for the Canadian farmers, in a certain sense, had inherited the Shorthorn idea, and have not swerved from it in any material degree. They had a natural eye for a "beef critter," and that, together perhaps with the inability to pay \$30,000 for a six-months' heifer, kept them in the more legitimate paths of improvement. During all this time it is to be observed that the Shorthorn, among all other beef breeds, was "*facile primus*." If then, as now, other breeds of cattle had been pushing the Shorthorn to the wall and making that race fight for its honors, it is safe to say that the breeders of this magnificent race of cattle would have been saved from the folly of attempting to ennoble a single family by false and unscientific methods at the expense of the rest of the race. The danger from this cause is now, fortunately, passed, probably never to return, for the other beef breeds—the Herefords, the Aberdeens, and the Galloways—are pressing the Shorthorn so hard for their honors that the breeders of the latter animal have no time to waste in looking for a better rule of breeding than "the selection of the fittest." The Shorthorns were among the first pure-bred animals to be introduced into the province, and they have held their predominance in numbers to the present time. Professor Brown, of the Ontario Agricultural College, to whom I am largely indebted for the materials for this report, says there are three hundred and fifty herds of pure-bred cattle of all classes in the province of Ontario, and of the total number of pure-bred bulls nine-tenths, and of the total number of pure-bred cows six-sevenths, are Shorthorns. The preponderance of this breed may also be seen from the fact that at the fat stock show held in this city December 14 and 15, 1883, there was no animal shown except Shorthorns and their grades. The earliest herds to be established in this province were those of Messrs. F. W. Stone, John Snell & Sons, James J. Wright, James Cowan, and William Douglass during the years 1853, '54, '55, since which time Shorthorn herds have become widely extended, the principal ones being in the counties of Wellington, Brant, Middlesex, Waterloo, Ontario, Perth, York, Oxford, Bothwell, Simcoe, Huron, and Bruce. As a race of cattle the Shorthorns are generally admitted to be superior for stall-feeding purposes, maturing early and taking on flesh evenly and rapidly. I have given at the close of this report some figures bearing upon this subject derived from the fat stock show, to which reference has already been made. I was present at the Toronto Industrial Exhibition, last September, when there was a large display of Shorthorn cattle of all ages and representing a wide extent of the province. It was a very creditable display indeed, and one that would have been difficult to excel anywhere. But while equally good animals could probably be found in the United States I am of the opinion that the prices here are considerably lower than with us. I quote at considerable length the

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report from the agricultural college of Ontario concerning the Shorthorns on the college farm :

We can speak highly of the milking properties, in quantity and quality, of the most of our cows of this breed—making good calves or reliable milkers, as the case may have been. We have nothing to say against the sure breeding of the cows, but our four bulls in three years have not given satisfaction in this respect. Without exception they have caused delay, loss, trouble, and extra expense, why, I am not prepared to say; two were imported and two Canadian bred; none were ever in such high flesh as those of some other breeds. If 'tis said the choice of individual bulls was bad, then the reply is that three independent judges did so; if management by want of practical knowledge is charged, then the same management had to do with the other bulls that have stood so well. If the Shorthorn requires on an average more drawing-room attention than other beefing breeds, then it had better be acknowledged at once, and I don't think their admirers need be ashamed of the fact. We have fattened Shorthorn grades, Hereford grades, Devon grades, Ayrshire grades, and Galloway grades for beef both in the stall and on pasture, and nothing equals the Shorthorn in giving that stamp to produce weight in the shortest time on *Ontario conditions*—growth of youth on good pasture and finishing in the stall.

THE CANADIAN AYRSHIRE.

In the report of the Agricultural and Arts Association of Ontario for the year 1882 the number of Ayrshire cows in the province is estimated at three hundred and bulls at one hundred, scattered through the counties of York, Ontario, Simcoe, Peel, Halton, Wentworth, Frontenac, Lanark, Carlton, Russell, and Prescott, with a few in Oxford and Northumberland. The Ayrshire cow has long been famous the world over for an enormous yield of milk, rich in cheese-making properties, and in Canada she seems to have fully maintained her pre-eminence in this particular. Speaking from nothing but my own observations, I should say that the Canadian Ayrshire would average somewhat larger than the same breed in the United States. This I think may probably be the result of the natural beef-breeding tendencies of Canadian farmers and the unconscious influence of Shorthorn neighbors. The report from the agricultural college concerning this race of cattle is as follows:

We have had a pretty thorough test of the Ayrshire cattle. In sure breeding we have no cause to complain nor can anything be said against their adaptability in raising a calf. Every cow we have has to be milked three and four weeks previous to calving—an imperative necessity to avoid milk fever; after calving, two of our best have regularly suckled two calves and, in addition, have had to be milked with the hand twice daily for two or three weeks, depending upon the time of year, whether on grass or in stall. We have not, however, been treated to that continuance of milk that I was intimate with in the Lothian of Scotland—the great flow lessening more rapidly and dribbling too long. I do not attribute this to actual poorer pasture or keep otherwise, but to the great difference in climatic condition and the want of that important variety of grasses secured only in permanent pasture. It is not true in our experience that the Ayrshire cow gives a lack of milk on comparatively bare pasture, in which regard she is on an average decidedly inferior to the Canadian, but it is true that her milk is of that blue type—not so rich in cream—as characterizes them in their own country. * * * Practically, then, as regards the pure Ayrshire, they require good treatment and order to maintain their famous milking properties, and I am of opinion that an infusion of new blood is as often needed as in any other breed—not so much a change of bull from other herds in this country as that of a directly imported one.

As to prices I am quite sure that Ayrshires of pure blood of average excellence can be bought for much less money in Canada than in the United States.

THE CANADIAN HEREFORDS.

This breed is comparatively a newcomer in Canada, although Mr. F. W. Stone began importing them into this province in 1860, much to the amusement of the Shorthorn breeders, who had a curiously satisfied faith

that their favorite was the *ne plus ultra* of a beef animal and that any attempt to equal, much more surpass, it was simply ridiculous. The Herefords came, however, and they came to stay, and in the last few years have so pressed the Shorthorns for their laurels that it has long since ceased to be a matter for mirth with the Shorthorn men. As nearly as I can get at it, the comparative merits of the breeds are about like this: The Shorthorn is the better for stall feeding, the Hereford for grazing. The Shorthorn breeders generally concede this. I doubt if the Hereford breeders will concede anything. The Herefords on the college farm are reported as follows:

This breed has exhibited a very clear and steady line of conduct all throughout. No trouble in breeding and no petting required. The Hereford is a good mother, second only to the Devon in our experience, and ahead of its dangerous compeers, the Shorthorn and Aberdeen Poll. We have been charged with partiality and lack of practical experience in cattle life by one of our American critics—especially in comparing Herefords and Shorthorns. This is not true, and I trust will never be so. As responsible to a liberal Government and guiding a grand country it is above all things our religious duty to report just how it is in every case—no coloring, no exaggeration, and no understatement of anything whatsoever. To say more is unnecessary; to say less would savor of want of interest. The Hereford, I repeat, has shown a uniformity in conduct quite exceptional along with the Devon; without grain winter and summer, bran excepted, and the usual treat after calving, the Hereford keeps fat on pasture and in stable, never falling off, even when suckling. Greedy enough, no doubt—down to the horse manure—not a specialty, as showing a want of something, but a consistent looking out for number one. We have no breed, as a whole, nor individuals among breeds, that can touch the Hereford in maintaining flesh on pasture. * * * The fattening steer from the Hereford bull and Canadian [native] cow is quite characteristic. The marking is strong and unquestionable. The build is a Hereford in almost every detail, the pig ham (as age advances), the round, compact barrel, longish rumps, deep twist, and the general low, chunky set of the whole animal.

The Herefords have been gaining very rapidly in form for the last few years, and are now in great demand as stock bulls on the ranches and in the great herds of the plains. One prominent Hereford breeder says in a private note to me:

Within less than one year there have been five new breeders of Herefords added to the list in my immediate vicinity. The demand both here and in the West is increasing very fast.

Another, a breeder of both Shorthorns and Herefords, writes:

My impression is (although a Shorthorn breeder) that the Hereford cattle are the best grazers of any breed, particularly for the Western States—i. e., they will make more good beef on pasture quicker than any other breed; of good constitution; suited to the Southern as well as the Western States. They are yearly in greater demand. If we had fifty times as many, they would sell in the Western United States. In the last four years more Herefords have been imported into Canada from England than any other breed.

The Hereford is invariably red, with a white face. They numbered in the province in 1882 seventy bulls and two hundred cows.

THE CANADIAN DEVONS.

For a medium-sized beefing breed, with a fairly good dairy attachment, the Devons have their admirers. They are a very handsome race of cattle, deep red, with fine shapely horns, and of a very uniform appearance. For working oxen they are unequaled, being always well matched, strong, and active. They are hardy and hearty. The report of them from the Agricultural college is as follows:

The remarkable feature of the Devon with us has been a uniform conduct—no coming and going in anything, but an even run of breeding, health, and good doing under all conditions. Summer and winter the Devon is equally at home—plump on

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pasture and in good heart in the stall without grain. They have also been particularly good mothers, nursing their calves in a manner superior to anything in our experience. The Devon calf is always a full calf on its milk alone—rolling in fat, and with all the build of an old animal. The particular character of the breed and rich milk give these results. After weaning and all up to heiferhood breeding, there is a distinct heartiness and vigor, on the small scale as regards size; there is no stunting according to their kind, but one has to know the kind in order to appreciate the difference between them and the larger beefers. We have never got much milk from a Devon, but in quality it is second only to the Jersey. The bull attains a greater size and weight proportionally to the cow than the same thing in most other breeds. * * * The Devon cow, therefore, is a milker in quality and moderate quantity, while the bull gives a frame to the steer that compares well with others for beef carrying. But the steer will not mature so early as the Shorthorn, Aberdeen Poll, and Hereford, nor even attain the same weight on an average.

The Devons number in the province about forty cows and twenty bulls.

THE CANADIAN BLACK POLLS.

The Aberdeen or Poll Angus is the same animal. The Galloway is now regarded as a distinct breed, but I am told by a large importer and a gentleman who has dealt in these cattle for many years that forty years ago they were all considered as one race of cattle, but that the respective breeders, living at the extremes of Scotland, after awhile naturally separated the cattle in their classification, and the one race became two; each one with a herd-book of its own. They are all, however, hornless, all black, and all Scotch. The Aberdeens are larger and finer—more like the Shorthorns—indeed it is not improbable that the original race has somewhere a Shorthorn cross. They are immense mountains of flesh and not without an odd beauty. The Galloways are coarser haired, smaller, and said to be harder. The gentleman to whom I just referred told me that he imported some Galloways as many as twenty-five years ago, but that there was no demand for them and they gradually disappeared. Recently, however, they have commenced to be called for, and there is now quite a demand for them. This month he sent forty-seven head of Galloways from this city to Illinois, at an average price of \$300. He brought them from Scotland in September. Of the Aberdeen Polls, Professor Brown says:

We hold the honor of having introduced this breed to Canada. * * * Our experience thus far is somewhat irregular: Health and breeding have been very good: milking sure, in moderate quantity and rich, with plenty of flesh, both in stall and on pasture, yet we have to record an indefinite sort of instability difficult to explain—I speak now of the first imported animals and their progeny, not of 1881 purchases. The instability in question has reference to a coming and going of health, especially in summer, as indicated by change of coat and general "staring" of the whole animal, as if going through a course of medicine. Individual animals of any class often do so, as everybody knows, but not a whole herd of one kind. There has been no sickness actually. We have on hand four very fine steers—the first cross of an Aberdeen Poll with Shorthorn grade cows—with which we trust to convince the province ere long as to the eminent beefing properties of the Black Diamonds of the north of Scotland.

ONTARIO JERSEYS.

There are two celebrated herds of Jerseys in this province, and several smaller ones. Mr. Fuller's herd has been made famous by the record of his Mary Anne of St. Lambert, that made 27 pounds 9½ ounces of butter in seven days, and as a result the Stoke Pogis blood is in great favor. At one time the same danger threatened Jersey breeding that has been referred to in speaking of the Shorthorns, viz: Family fashion

as opposed to the general improvement of the whole race. Fortunately, however, the claim that the Jersey was the best butter cow on earth was soon challenged that it became the common interest of all Jersey breeders to improve the race as a whole, and no sooner has one "family" gone to the front than another has outstripped it, and the different strains of blood have become so mingled by anxiety of breeders to cross for merit—the only true theory of breeding—that it is almost impossible to tell which is the most potent blood element in any particular animal, and quite as impossible to say which is the best of a score of Jersey "families" as it is to find a straight pedigree, with no outcrosses in any. At the present time an Alpeha, a Coomassie, a Rex, a Signal, a Jersey Belle of Scituate, a Eurotas, or a Stoke Pogis, and a hundred others, means very little and is worth very little in the name, *unless* the immediate ancestors have a butter record at the scales. The general demand for a "test" has benefited immeasurably the whole race and destroyed at once and forever the silly "family" folly and the still sillier "color" craze. It is possible that the whole Jersey race is of such uniform excellence that all that is needed at any time or in any place is a little extra feed and a little extra care to *create* a "family." At all events, henceforth, there is no royalty in Jerseys, and "the best cow wins." Prices are higher in Canada, on the average, than in the United States, and if we needed a market we could find a profitable one here.

CANADIAN HOLSTEINS.

There are some Holsteins in Canada, but not many. Their admirers claim for them size and an immense yield of rich milk, and consider them the best "general purpose cow" in the world.

GENERAL REMARKS.

Considering that facts *bona fide* from breeders would be of much more value than any amount of theory or guess, I sent out printed interrogatories to many of the leading breeders in Ontario, and although I did not receive as many replies as I could wish, yet such as I have received I have placed as far as possible in tabular form at the close of this report. It is almost the universal custom among the Shorthorn breeders to allow the cows to suckle their calves for from four to six months, and I judge the same practice prevails generally among the other beefing breeds. Of ordinary cattle for slaughter this province has a large surplus, which seeks a market both in the United States and England. I have given some figures elsewhere upon this point. Of the pure bloods there is really no surplus, although some bulls of the beefing breeds, and cows to a less extent, are sold in the United States, and on the other hand others are brought in from there. The trade in these animals is unique and has not yet acquired a steady flow in either direction; if the United States had a surplus of almost any breed except Shorthorns, Ayrshires, and Devons, I think a market could be found here. Canada seems to be sufficiently supplied with those named.

In the following tables I have endeavored to present in as compact a form as possible the facts offered by the various breeders who have furnished me information. These reports from various herds represent *averages* in these herds. The question concerning soil, grasses, &c., were generally answered. The altitude and mean temperature of the different localities were not generally known. The Toronto Observatory

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gives the elevation of Toronto above Lake Ontario at 108 feet, and the approximate elevation above the sea, 350 feet; the mean temperature for 1882 was 45.42°; highest, 89.9°; lowest, 17.4°.

The herds represented in these tables are, many of them, large prize-winners. In one or two instances there seems to be an evident *anomaly*, but I have given the figures as they were given to me. The same number refers in each case to the same herd.

WALTER E. HOWARD,
Consul.

UNITED STATES CONSULATE,
Toronto, December 29, 1883.

Special statistics concerning Ontario cattle.

Breed and herd No.	Males.	Females.	Months in milk.	Yearly yield of milk.	Milk for 1 pound butter.	Milk for 1 pound cheese.	Age at maturity.	Live weight at maturity.			Weight of meat at maturity.			Price.			
								Cow.	Bull.	Ox.	Cow.	Bull.	Ox.	Cow.	Bull.	Cow calf.	Bull calf.
Shorthorn :				Lbs.				Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.				
1	15	45					4	1,300	2,400	2,000				\$150	\$100	\$120	\$150
2	6	44	7				3	1,800	2,500	2,400	1,600	1,400	1,200	300	400	200	300
3	5	34					3	1,700	2,300	2,300	1,020	1,450	1,475	200	150	150	100
4	12	15					3	1,600	2,000								
5	5	22					4	1,700	2,400	2,100	1,225	1,850	1,600	250	250	220	250
6	4	23	9	4,050	25		3	1,600	2,200	1,800	1,200	1,600	1,400	150	150	100	100
Ayrshire:																	
1	10	30	9	7,000	25	10	6	1,050	1,600		800			125	125	50	50
2	14	26	10				5							150		60	
3	3	30												100	100		50
4	2	62		6,000										150	300	100	125
5	4	23	10	5,700	23	9	5	950	1,050		500	600		75	50	25	10
6	3	25	10	5,000	20	10	6	900	1,700		600	1,200		125	100	35	30
Hereford:																	
1	35	100	7					1,500	2,000	1,800	975	1,360	1,170				
2	6	18	8											450		300	250
Devon:																	
1	5	4	2	6,000	20	10	6	1,400	1,900		950	1,250		100	125	75	75
Galloway :																	
1	10	45	9				3	1,300	2,000					300	400	200	200

GENERAL AVERAGE.

Breed.	Origin.	No. of herds.	Aggregate number of animals.	Average months in milk.	Average annual yield of milk.	Milk to 1 pound butter.	Milk to 1 pound of cheese.	Age at maturity.
Shorthorn	England	6	220	8	Lbs.			
Ayrshire	Scotland	6	238	9	4,050	25		3½
Hereford	England	12	159	7.5	5,925	24½	9½	3
Devon	do	1	11	8				6
Galloway	Scotland	1	45	9		20	10	3

CATTLE AND DAIRY FARMING.

Special statistics concerning Ontario cattle—Continued.

GENERAL AVERAGE—Continued.

Breed.	Live weight at maturity.			Weight of meat at maturity.			Chief value.	Price.			
	Cow.	Bull.	Ox.	Cow.	Bull.	Ox.		Cow.	Bull.	Cow calf.	Bull calf.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.					
Shorthorn.....	1,616 ⁹	2,300	2,100	1,114	1,575	1,416 ²	Beef..	\$216 ³	\$208 ⁸	\$161 ²	\$175
Ayrshire.....	1,663	1,450		633	900		Dairy.	120	135	54	48
Hereford.....	1,700	2,000	1,800	975	1,300	1,170	Beef..	450		300	250
Devon.....	1,400	1,900		950	1,250		..do..	100	125	75	75
Galloway.....	1,300	2,000					..do..	300	400	200	200

Topography, &c.

Breed.	Record No.	Altitude.	Mean temperature.		Soil.	Substratum.	Cultivated grasses.
			Summer.	Winter.			
		Fect.	o	o			
Shorthorn	1				Loam		
	2				..do..		Timothy and red clover.
	3	1,200	70	45	Clay and loam...	Limestone and clay.	Timothy, red clover, and orchard grass.
	4				Loam	Clay and gravel	Timothy and red clover.
	5				Alluvial, loam, and clay.	Limestone and gravel.	Timothy, red clover, and orchard grass.
	6				Clay	Clay and gravel	Timothy and red clover.
Ayrshire	1				Clay and loam...	Clay	Timothy, red and white clover, alsike, and orchard.
	2					Limestone and clay.	Timothy and clover.
	3						
	4				Alluvial, loam, and sandy.		Do.
	5				Clay and loam...	Limestone, clay, and gravel.	Clover.
Hereford	6				Clay and sandy...		Timothy and clover, red-top, and blue-grass.
	1				Various	Clay	Timothy and clover.
	2					Limestone and gravel.	Timothy and red clover, and a variety to make thick pasture.
Devon.....	1	70			Clay	Clay	Timothy and red clover.
Galloway...	1	1,100	53.38	25.15	Clay and loam... Alluvial, sandy, and loam.	..do.. Limestone and gravel.	Do. Timothy and clover, alsike, trefoil, and orchard grass.

Price.

Bull.	Cow calf.	Bull calf.
\$208	\$161	\$175
135	54	48
125	75	75
400	200	200

Breed.	Herd No.	Housing.	Feeding.	Breeding.	Compared with same breed in native home.
Shorthorn.	1	Warm stables ..	Turnips, hay, peas, oats, and bran chopped and mixed.	Select best bulls	Improved.
	2	.. do	Suckle calves seven months; chopped feed.	Breed heifers at fifteen months, but, don't let them suckle calves first year.	
	3	Bank-barn stable.	.....	.....	
	4	Stables under bank barn.	Turnips and hay	Select best bull to produce flesh quickly and early maturity.	
	5	Tied in stalls ...	Whole hay, sliced roots, and buck-wheat.	Breed heifers at two years and avoid close relationship.	
	6	.....	.....	.....	
Ayrshire..	1	Stone stables under barn.	Roots and hay	Select sires of best milking strain.	As good.
	2	.....	.....	.....	Improved.
	3	Chained in warm stables.	Steamed, chopped corn-stalks, roots, and clover.	.....	Do.
	4	Warm stables...	Four quarts of meal, half bushel roots, and hay.	.....	Quite equal.
	5	do	Turnips, chopped straw, and half hay.	.....	Not improved.
	6	.....	.....	.....	.....
Hereford ..	1	Stables and sheds.	Few roots and meal.	Use best bull and keep best females.	Have bred some better.
	2	Stable under bank barn.	Turnips, carrots, and hay.	.....	Held their own.
Devon	1	Stone stables under barn.	Four quarts of barley twice a day, wet.	.....	About the same.
Galloway ..	1	Loose boxes and stalls. Daily exercise.	Small quantities of ten, turnips with straw and hay.	Careful selection of pure bred bulls.	Improving.

Some Shorthorns entered at the fat-stock show, Toronto, December 14 and 15, 1883.

Thoroughbreds.	Age in days.	Weight.	Grades.	Age in days.	Weight.
		<i>Pounds.</i>			<i>Pounds.</i>
Steer	1,342	2,200	Steer	1,379	2,120
Do	1,336	1,920	Do	1,095	2,230
Do	947	2,110	Do	1,095	2,150
Do	545	1,220	Do		1,930
Cow	2,139	1,920	Do		977
Do	2,045	2,250	Do		910
Do	1,714	1,690	Do		910
Do	1,245	2,350	Do		1,650
Steer	1,714	2,350	Do		940
Do	880	1,700	Do		639
			Cow	1,330	2,570
			Do	730	1,570

During the two days of the show twenty-two thoroughbred Shorthorns were sold at auction, averaging \$128; the highest figure reached was \$375 for a three-years-old bull, the lowest, \$40, for a yearling heifer.

CATTLE AND DAIRY FARMING.

GRADE AND NATIVE CATTLE.

The number of grade and native cattle in the province of Ontario is given in the following table for the years 1882 and 1883:

Description.	1883.	1882.
Working oxen.....		
Milk cows.....	17,088	14,566
Store cattle (over two years).....	661,808	465,382
Other cattle.....	322,154	272,208
Total.....	700,949	610,547
	1,821,907	1,562,683

In 1882 the number of thoroughbred cattle of all kinds was estimated at 13,000.

CATTLE IN ONTARIO.

REPORT BY CONSUL HAZELTON, OF HAMILTON.

I have the honor to transmit this report with inclosures in compliance with "Cattle circular of July 18, 1883," issued by the Department of State.

The total number of thoroughbred cattle in Ontario is about 23,704, of which 15,385 are Durham (Shorthorn), 4,496 Ayrshire, 1,438 Devon, 1,189 Galloway, 841 Hereford, 270 Aberdeen Poll, and 85 Jersey.

These are distributed through the several counties of the province, as shown in accompanying table * inclosed. In addition to these about fifty Holsteins have been imported this year from Holland for breeding purposes. There are several breeders of blooded cattle in Eastern Ontario to whom I am indebted for information received concerning the breeds kept by each. Most of their herds have been bred pure since imported, which is about twenty years. All say that these breeds are superior in Ontario to the same breeds in their native countries, maintaining that the cold dry climate of Canada is eminently fitted to impart constitution and quality to pure-blooded cattle.

In Ontario the Durham takes the lead, comprising 65 per cent. of the entire number. It is a good milker, produces superior beef, is not especially expensive to raise, and when crossed on a native cow the grade is very satisfactory. It is the oldest of the imported breeds, and its qualities are better understood by farmers generally than those of any other.

The Ayrshire stands next in favor, being celebrated for its cheese-producing qualities. It comprises about 19 per cent. of the entire number, but is not increasing.

The Hereford is hardy, and is chiefly celebrated for its beef-producing qualities. Mr. Frederick W. Stone, of Guelph, a man of large experience in breeding stock, writes me regarding the Hereford as follows:

The Herefords thrive well on good pasture, stand heat better than many breeds, also cold, are generally of good constitution. I think they are the best grazers of any pure breed of cattle, and superior to any to cross on the native cattle in the Western and Northern States. The percentage of Herefords is 34.

* A printed table (Canadian official), containing the same statistics covered by Consul Hazelton's table here referred to, with the exception of eighty-five Jerseys in Wentworth County, will be found embodied in the report from Consul Pace, of Port Sarnia. For this reason Consul Hazelton's table is omitted.

is given in the

1883.	1882.
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101,808	465,382
222,154	272,208
300,040	610,527
21,907	1,502,683

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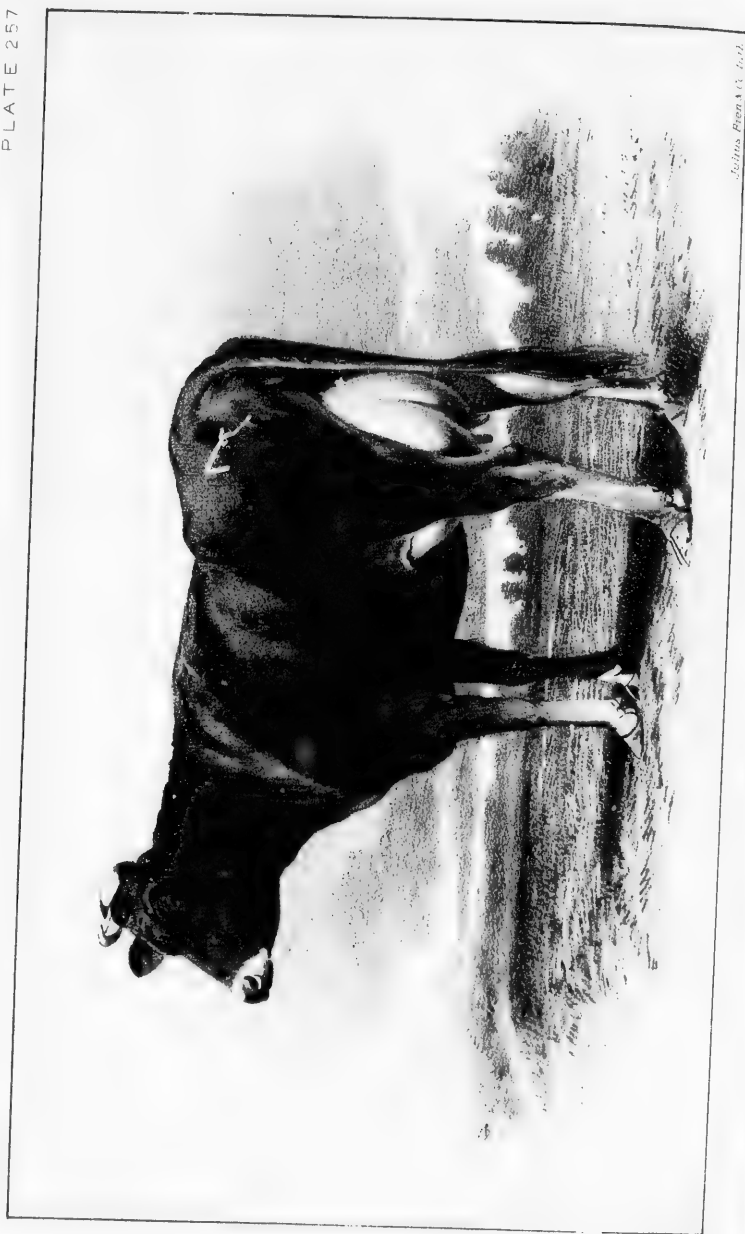
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"OAKLAND'S CORA"

"OAKLAND'S CORA"





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The Devon possesses many of the qualities of the Durham and is preferred by some, although not generally a favorite. Of these the percentage is 6.

Galloways comprise 5 per cent. These are without horns, are average milkers, and produce an excellent quality of beef.

The Aberdeen Poll is also chiefly celebrated for its beef-producing qualities.

The price of bulls of the several breeds above named ranges from \$50 to \$200 each, according to age and quality, those from one and one-half to two years old being preferred.

The number of each of these breeds, excepting the Durham, in Ontario, is so small that they may be fairly said to be on trial. A disposition to investigate the qualities of the same exists largely among the farmers, however, and a small number of one of the choice breeds may be found frequently on the stock farms, where they are kept for breeding purposes.

Very few are sold outside the provinces so far as I can learn, but the surplus finds its principal market at home.

EXPORT OF FANCY JERSEYS TO THE UNITED STATES.

The number of Jerseys in Ontario is so small that it was omitted entirely from the cattle reports of 1882. There is a herd of this breed, numbering eighty-five, near Hamilton, owned by Valancey E. Fuller, whose letter I inclose. In this herd is the celebrated cow "Mary Anne of St. Lambert," which has made an average of $3\frac{1}{2}$ pounds of butter per day for one hundred and fifty consecutive days. The reputation of this cow has extended to the United States, resulting in a demand for Jerseys at high prices. In answer to which Mr. Fuller has sold and delivered to various parties in the United States during the months of October and November, twenty-four of these cattle of various ages, at prices ranging from \$400 to \$6,000 each, amounting in the aggregate to the sum of \$40,000, no other breeding cattle having been shipped from here during the past year. These have been shipped from here by rail at an expense ranging from \$25 to \$50 each, according to distance and circumstances. Heifers and young bulls are delivered with less cost and trouble than milch cows and older bulls. With the latter a man is usually sent to attend the same as required, thereby increasing the cost of delivery in the amount paid for railroad fare, wages, and personal expenses of the attendant. Several of the yearlings have been delivered by express. These were tied in small movable wooden stalls made for that purpose, and in that manner put on board the express car and carried to their destination.

I inclose cuts of the celebrated Jersey cow "Mary Anne of St. Lambert," and "Oakland's Cora," of the same herd, furnished me to-day by the owner.

MISCELLANEOUS INFORMATION.

The increase of stock in this province is considerably in excess of the home demand. The surplus in this district finds its principal market in the United States.

Of the whole number of cattle in Ontario the percentage bred for the dairy is 42, for the butcher 17.

The soils of Ontario are variable, but all are well adapted to grazing purposes.

In the western half of the province there is a great depth of alluvium, chiefly Erie and Saugeen clays and Artemesia gravel, which form the

bases of the soils. In the eastern part, say east and north of a line drawn from Kingston to Collingwood, the average depth of alluvium does not exceed a few feet, and is generally of Laurentian or Huronian origin. The middle section partakes of the nature of both the others. The pastures are generally rich, and the country abounds in lakes and streams.

J. F. HAZELTON,
Consul.

UNITED STATES CONSULATE,
Hamilton, January 10, 1884.

Special statistics concerning cattle in Eastern Ontario.

Name of breed.	Annual average yield of milk.	Milk to pound of butter.	Milk to pound of cheese.	Live weight, average.			Age at maturity.	Weight of meat at maturity.
				Cow.	Bull.	Ox.		
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Years.</i>	<i>Pounds.</i>
Ayrshire	6,000	23	10	800	1,200	1,400	3	750
Aberdeen Poll	6,000	24	10	900	1,500	1,600	3	900
Devon	5,500	22	10	900	1,500	1,600	3	900
Durham	5,500	22	10	1,000	1,600	1,800	3	900
Galloway	6,000	24	10½	950	1,500	1,600	3	1,000
Hereford	6,000	24	11	1,000	1,600	1,800	3	900
Holstein	6,500	26	12	950	1,500	1,600	3	950
Jersey	6,500	20	10	800	1,200	1,400	3	800
								700

Name of breed.	Color, &c.	How long bred pure.	Origin of breed.
		<i>Years.</i>	
Ayrshire	Spotted, red and white; fine sharp head; heavy behind; long horns.	20	Scotland.
Aberdeen Poll	Black; no horns; heavy.	10	Do.
Devon	Black; long bodies; well shaped	20	England.
Durham	Brown; short horns; heavy quarters	35	Do.
Galloway	Black; no horns; ungainly	10	Do.
Hereford	Red with white face; short legs; long bodies	20	Do.
Holstein	Spotted, black and white; horned; large	15	Holland.
Jersey	Gray; small limbed; smooth		Jersey.

Topography: Altitude, 250 feet above the level of the sea. Mean temperature, 45.42°; summer, 57.66°; winter, 33.17°. Soil: A few feet of alluvial in Eastern Ontario, great depth in Western Ontario, and middle section an average; loam, clay, sand, &c., to some extent; all three in Eastern Ontario, according to location. Substratum: Limestone, large quantity; sandstone to some extent; granite, very little; clay and gravel, large quantities.

Cultivated grasses: Timothy and clover are among the principal crops; rye-grass not abundant.

Housing, feeding, &c.: The cattle are housed in good barns with sheds attached, most of them tied up in winter at night; others in stalls and boxes, depending on kind and value of animal. Good mixed hay, a few roots, and a small quantity of chopped oats, corn, peas, or barley in winter constitute the feed. For breeding the male and female of good constitution and qualities are used. The product is sold generally to farmers and breeders to improve their stock.

JERSEYS IMPROVED BY IMPORT.

Mr. Valancey E. Fuller to Consul Hazelton.

HAMILTON, ONT., December 17, 1883.

DEAR SIR: As you are aware the character of the soil in and around Hamilton is from a light sandy, gravelly soil to a stiff clay, and this part of Ontario is underlain by limestone.

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ELTON,
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Age at maturity.	Weight of meat at maturity.
Years.	Pounds.
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3	700

Age at maturity.	Origin of breed.
Years.	
20	Scotland.
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Jerseys have been bred within 60 miles of Hamilton for the past eight to ten years. I have now on my farm 5 miles from Hamilton the largest herd in Canada, numbering 85 head. There are in Ontario about 600 thoroughbred Jerseys.

In my herd is the cow Mary Anne of St. Lambert (four years old), who has made the largest weekly yield of butter, 27 pounds 9½ ounces in seven days, and the largest yield ever made for five consecutive months of one hundred and fifty-five days, 511 pounds 8½ ounces, and an average of 3½ pounds of butter per day for one hundred and fifty consecutive days. She, like the majority of my herd, was raised in Canada, near Montreal, as were a majority of her ancestors, proving clearly the Jerseys are capable of standing our extremely cold dry climate, inasmuch as the thermometer goes as low as 20 degrees below zero at Montreal, and the winter there is a very severe cold one. It is, however, very dry.

My experience of the Jerseys bred for any length of time in Ontario or the province of Quebec is that they increase in size very materially; that their constitution is very greatly strengthened, and that consequently they are larger milkers than with less constitution and size. This size is attained without losing their characteristic faculty of being able to convert their food into milk very rich with butter fat. I attribute this increase in constitution and size very greatly—

(1) To our climate, believing the same experience holds good with cattle as with human beings, the nearer we approach the north pole the more robust and vigorous do the race of men (and I think cattle also) become. The dryness of our winter prevents the extreme cold being so much felt, and imparts vigor to the system. I consider the cold bleak winds of the Atlantic coast far more trying to the cattle than our climate. Certain it is that (save in very extreme range of temperature) the Jerseys yield quite as large if not larger quantities of milk in a cold dry clear day than in a milder damp one in winter. We have no artificial means of heating our stables, yet the cattle never suffer from the cold. They are let out daily; in fact our custom is to rear many of our finest yearlings in the barn-yard and we consider the results most beneficial. Certain it is, that when our Jerseys, imported from the island of Jersey, have spent two to three winters with us they not only improve very materially in constitution, but are heavier milkers. Their progeny begot and dropped in this country have better constitutions.

(2) The limestone which underlies all our soil in this part of Ontario also contributes largely to the development of bone and constitution.

(3) The rich clover which abounds on good farms has in no slight degree assisted in making the Canadian Jerseys famous.

You have passed for me in one month stock sold to the United States amounting to no less a sum than \$40,000 for twenty-four head, many of them under two years old. These prices demonstrate the value they realize, and I am convinced that in our climate and with our grasses and pastures the Jerseys will thrive and improve.

The average production of milk in my herd is about 4,000 pounds per annum for heifers two to three years old, and from 5,000 to 7,000 pounds of milk for mature cows, though I have cows who give from 7,000 to 8,000 pounds of milk per annum.

Yours, truly,

VALANCEY E. FULLER.

J. F. HAZELTON, Esq.,
American Consul.

CATTLE AND CATTLE PRODUCTS IN SOUTHWESTERN ONTARIO.

REPORT BY COMMERCIAL AGENT BUFFINGTON, OF CHATHAM.

I have the honor herewith to submit the report requested by the cattle circular of July 18. I regret that, owing to an insufficient number of accurately recorded experiments by the breeders of the district, many blanks in the tabular form remain unfilled, while many of the statements filled in cannot lay claim to more than approximate accuracy.

CATTLE-BREEDING IN THE CHATHAM DISTRICT.

It is only within the last few years that, alarmed by occasional failures of the grain crops, the agriculturists in this district began to de-

vote special attention to the improvement of their herds upon scientific principles, and, as yet, the number able to state, with any degree of definiteness, the particular merits or demerits of any certain breed, reduced to figures, is indeed limited.

It is evident that this level, moist, generous, pasture-producing country is admirably adapted to stock-raising, as with the common, or "scrub" animals, interspersed with a small number of good grades and occasionally a few thoroughbreds, it bears an enviable reputation as a cheese and butter producing district, and one that is fully justified by the large and continually increasing output of the factories. Until recently the farmers had not awakened to the advantages to be derived from securing the best and most profitable fodder utilizers to consume the surplus feed of the farm.

The Ontario government has extended every encouragement to stock-raisers, and maintains, at a considerable annual outlay, an agricultural college and model farm at Guelph, where stock-breeding on scientific principles receives merited attention. The advantages afforded by this institution would, from the number of its students, seem to be fully appreciated by the agricultural community. Its teachings and reports, which are freely circulated, furnish information as to the relative qualities of the various breeds of cattle, &c., not easily attainable by the average farmer, few of whom have either facilities or patience to institute the comparisons there conducted, and which are so useful to the herd-owner.

The number of thoroughbreds in this district is not inconsiderable; and most of them are selected, imported males. The favorite shipping animal is the Durham grade—either a first or second cross of a pure breed male on a common or grade cow—which is in general favor. The peculiar merits claimed for it are rapid growth, early maturity, and large size. Some phenomenal weights are on record, and at a period when the "scrub" animal is too young for profitable fattening.

The Ayrshire is in high esteem by dairymen, and produces excellent general-purpose grades from thoroughbred Durham males.

The native, or Canadian breed—the old bush rambling cow, with perhaps a strain of finer blood—is a good milker and to a Shorthorn bull produces excellent general-purpose stock, remarkable for hardihood and milking qualities, under conditions of temperature and diet ruinous to a thoroughbred.

What breeders in this locality are anxious to secure is—(1) a weight-carrying frame; (2) an early maturer, say from two to three years; (3) a good forer; (4) fine flesh and minimum offal; (5) sure breeders and good nurses.

Extensive observation by the largest breeders here confirm them in favor of—(1) Shorthorn grades for weight, early maturing and stall feeding; (2) Hereford grades for hardiness and grazing disposition; (3) Aberdeen Poll grades for an even average; (4) Galloway grades for hardiness and fine flesh; (5) Devon grades for good nursing and sure breeding.

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RELATIVE YIELDS OF THE DIFFERENT BREEDS.

To aid in an understanding of the relative merits of the respective breeds I embody herewith a table showing the results of nearly five thousand tests made at the Agricultural College and Model Farm:

Breed.	Average weight of cow.	Duration of milking season.	Milk, per season.	Specific gravity of milk.	Per cent. of cream.	Cream by weight.	Butter from—		Cheese from milk.	Value per season of—			
							Milk.	Cream.		Milk.	Cream.	Butter.	Cheese.
	<i>Lbs.</i>	<i>Days</i>	<i>Lbs.</i>			<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>				
Shorthorn	1,570	170	2,550	97	10½	8½	4½	12	119	111	122	130	
Shorthorn grade	1,450	220	3,960	106	8½	5	2½	40	11	30	10	18	42
Aberdeen grade	1,300	170	2,380	111	8	6	5½	40	11½	18	7½	10	27
Aberdeen Poll grade	1,150	190	3,040	109	8½	0½	3	.....	.....	23	9½	.....	.....
Hereford	1,340	180	2,310	97	10½	4½	4½	60½	11½	17	5½	11	26
Hereford grade	1,100	200	3,570	106	13½	6½	2½	.....	7	27	11½	18	20
Devon	1,050	200	2,800	113	7½	8	3½	.....	10½	21	11½	19	45
Galloway	1,250	190	2,470	105	2	0½	.....	.....	9½	28½	8	11	23
Ayrshire	1,000	210	5,250	101	6½	8	3½	.....	11½	30	21	35	58
Ayrshire grade	1,030	220	4,400	102	4½	5	.....	.....	33	11	.....	.....	.....
Jersey	710	250	2,500	103	34	37	.....	.....	19	57	.....	.....	.....
Canadian	950	240	4,800	95	6½	8	.....	.....	11½	86	10½	29	54

NUMBER AND KINDS OF CATTLE IN THE CHATHAM DISTRICT.

The number of cattle in three counties, as per report of the Provincial Bureau of Agriculture, with a classified list of thoroughbreds, is given below.

County.	Thoroughbred.	Grade and native.				Milk cows, all breeds.	All classes.
		Oxen.	Milk cows.	Store cattle over 2 years old.	Other.		
Essex	434	251	9,680	4,033	10,292	9,742	25,202
Kent	550	161	16,900	8,023	17,656	17,035	43,919
Lambton	660	35	15,680	11,145	20,262	15,787	47,791
Total	1,644	447	42,320	24,400	48,210	42,564	117,032

	Durham.	Devon.	Hereford.	Aberdeen Poll.	Galloway.	Ayrshire.
Essex	246	34	33	25	17	79
Kent	301	32	41	1	37	48
Lambton	488	71	8	5	34	54

RELATIVE VALUES OF CATTLE FEED.

The following results of a critical test as to the relative value of various diets in their effects on the different breeds will not, I conceive, be without interest in this connection, as illustrating their particular idiosyncrasy as to fodder:

[From Model Farm Report.]

Corn fodder newly cut and drawn from the field when green, cut into inch lengths, packed into a common rough stone root cellar half under ground, and weighted with 600 pounds per superficial square yard, can be preserved, except adjoining such a wall, for an indefinite time in a condition fit for animal food, at a cost not exceeding \$1 per ton, exclusive of cultivation.

In competition with Swede turnips, ensilaged corn fodder gave 15 per cent. less milk, 20 per cent. less butter, and a poorer marketable butter in color.

Damaged wheat can be very economically used in the fattening of cattle—6 pounds per head per day give a daily increase of 2 pounds per head per day, at a cost of 44 cents per pound to the live weight.

Rice meal in the fattening of cattle gave a daily increase of 1.81 pounds per head per day, by the use of 6 pounds per head per day, at a cost of about 7 cents per pound.

Barley meal in cattle fattening requires a large amount of other foods in association, and 11½ pounds per head per day gave a daily increase of 2.14 pounds per head per day, at a cost of 7 cents per pound live weight.

Corn meal took the highest place in a daily rate of increase in the fattening of cattle; 9½ pounds per head daily gave 2.31 pounds per head per day, at a cost of 5½ cents per pound of the added animal weight.

Pea meal gave the second best daily rate of increase at the least cost of all the regular cattle-feeding grains. Eight and one-half pounds per head daily gave a rate of 2.28 pounds, at a cost of 5 cents per pound of the weight added to the animal.

A pure-bred Shorthorn steer can be brought to a weight of 1,700 pounds when one month under two years old, or a daily rate of increase equal to 2½ pounds per day.

Hereford grade steer calves can be made to average 611 pounds in 238 days, or a rate of 2½ pounds per day.

Aberdeen Poll grade steer calves can be made to average 720 pounds in 273 days, or a rate of 2½ pounds per day.

During winter, a 1,000-pound steer will consume daily 10 pounds hay 30 pounds turnips, 4 pounds bran, and 9 pounds of a mixture of grain, upon which it will add 2.11 pounds to its live weight.

One pound of added weight to a 1,000-pound steer can be obtained from the use of various materials that contain 11 pounds of dry substances chemically.

By a large variety of experiments with several classes of cattle and many kinds of food, we find the actual cost of adding 1 pound to the live weight of a 1,000-pound animal is 6 cents to the feeder who grows his own materials, and nearly 12 cents when the food is bought in the regular market—manure and management not considered.

Sugar beet, weight for weight with mangels and turnips, and in association with equal kinds and quantities of other foods, gave the highest returns in feeding cattle, or 2.70 pounds per head per day.

Mangels gave 2.38 pounds per head per day under similar conditions to the sugar beet.

Turnips (Swede) added 2.30 pounds per day to the average steer that weighed 1,061 pounds under conditions similar to mangels and sugar beet.

There is either a simple natural reason, or a hidden chemical one, in the fact that by the use of less grain and more roots, cattle gave a greater daily return in live weight.

COST OF CHATHAM CATTLE.

Selling prices vary widely, not only with the breed but also with the particular merits of the animals. Good pure bred bulls, fit for service, can be had at from \$100 to \$300, and younger animals at considerably lower prices, although it is not unusual to hear of fancy prices being paid for extra good stock.

BEEF EXPORT OF THE CHATHAM DISTRICT.

The beef trade is principally with Great Britain, and is found to grow more profitable as better stock is introduced. Beeves of 1,500 pounds and upwards pay well, and, as is obvious, the per capita cost of marketing a steer of 1,000 pounds or one of 1,800 to 2,000 pounds being the same, size is, for that consideration, as well as a demand in the foreign market for heavy stock, a desirable attainment. The average ruling figures for some time past have been from 5½ to 5¾ live weight, while for export, prices have ruled higher, better stock being required.

Before the abrogation of the reciprocity treaty considerable traffic in cattle was carried on between the United States and this province, via Port Huron, Detroit, and Buffalo, notably the latter. This has since greatly diminished, while the export to the British markets has largely increased.

Notwithstanding the small proportion of thoroughbreds in the district, there is always a large surplus of excellent stock suitable for beef, a fair proportion of which passes muster for the export trade. There is no lack of buyers at the barnyards and at the agricultural fairs.

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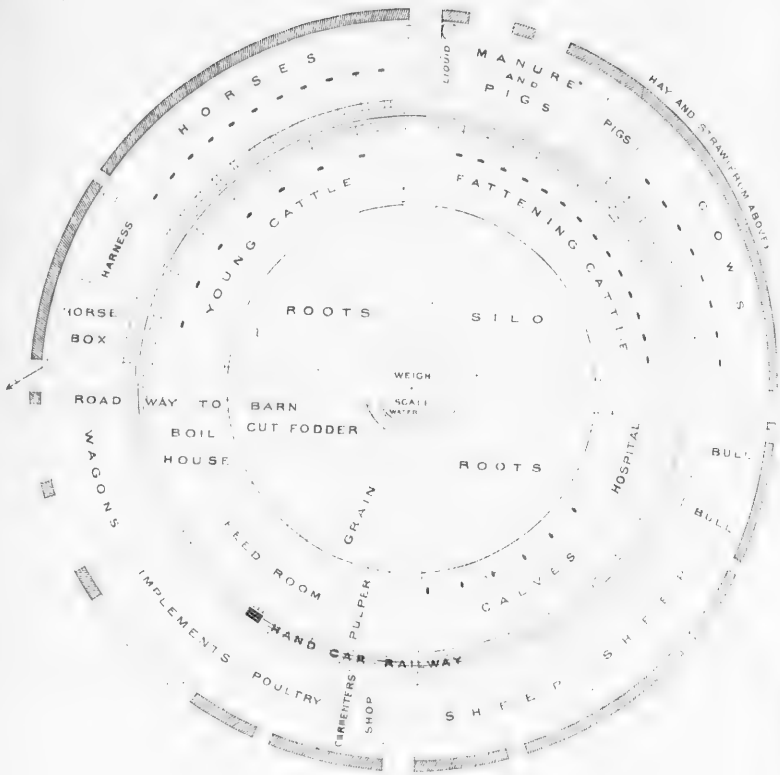
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FARM BUILDINGS OF THE FUTURE

Cultus Brand Co. Lith





PLAN OF THE MODEL STOCK BUILDING.

July 1906

FIG. 7



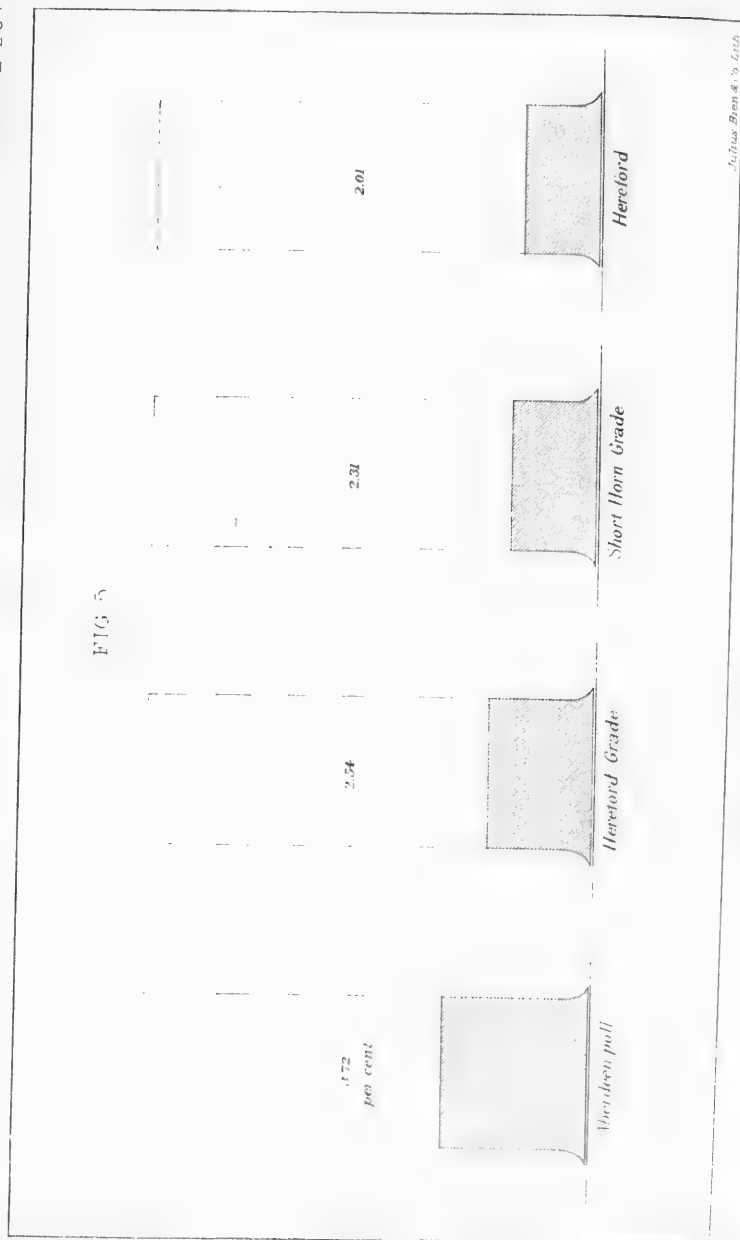
MILK, CREAM & BUTTER TESTS.

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FIG. 5



Milk, Cream & Butter Tests

MILK, CREAM & BUTTER TESTS.

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Hereford

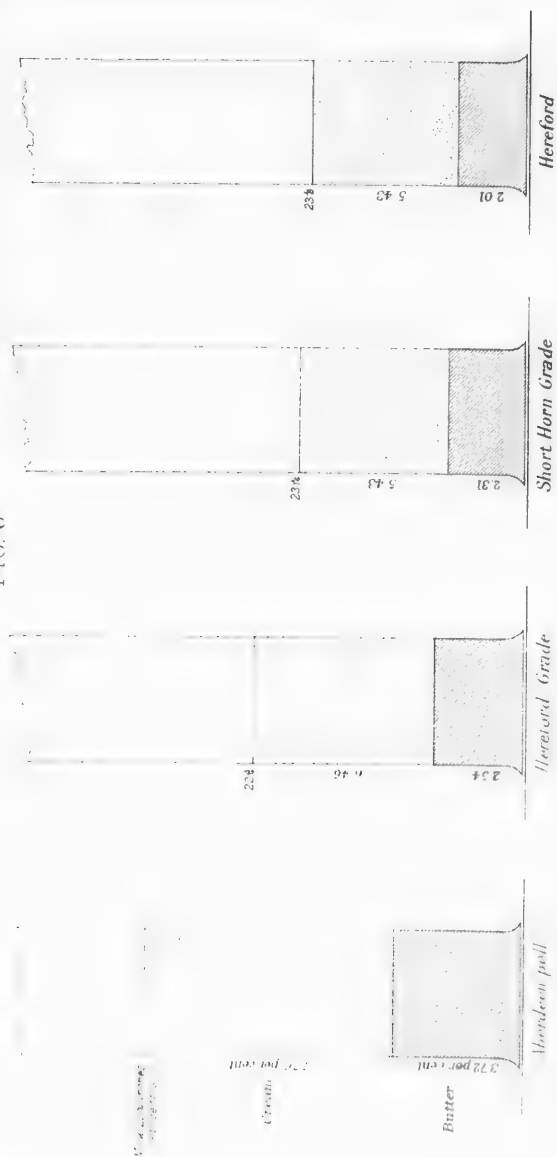
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MILK, CREAM & BUTTER TESTS.

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FIG. 6



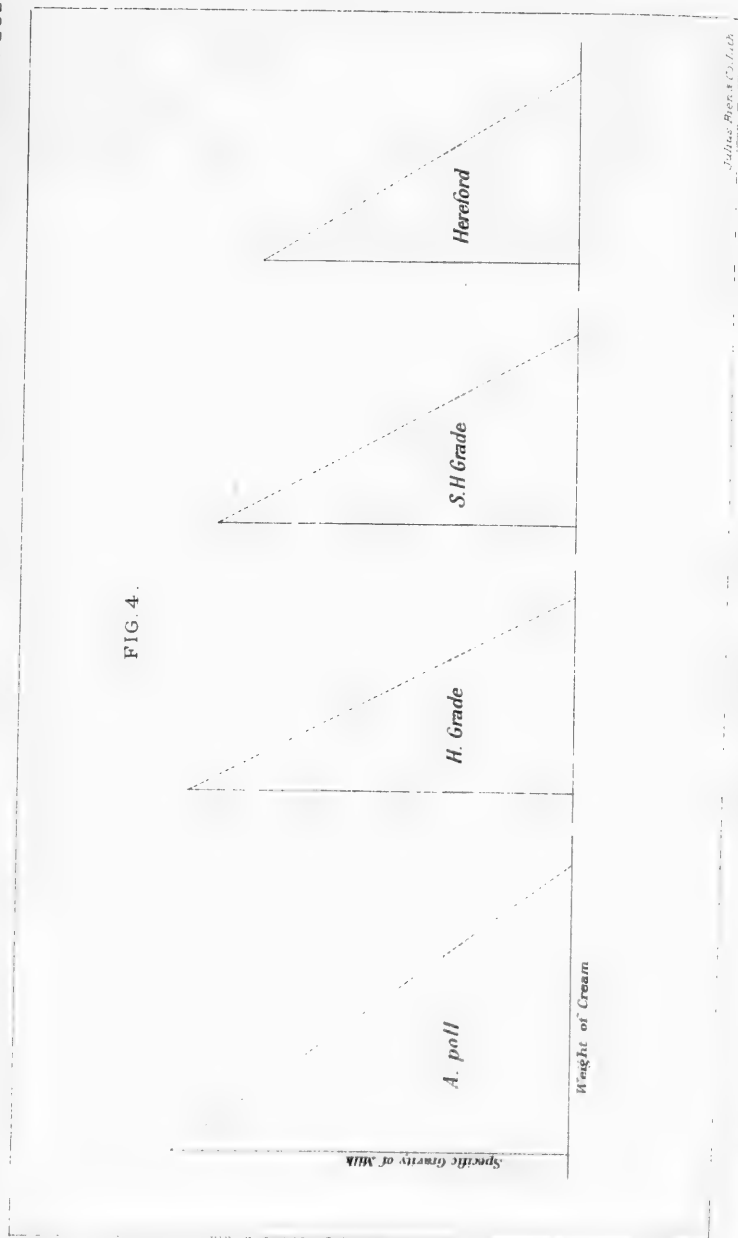
Adapted from the 1914

MILK, CREAM & BUTTER TESTS.
PERCENTAGE WEIGHT, WITH BUTTER, FROM MILK

MILK, CREAM & BUTTER TESTS.

1. REAM, BY WEIGHT, WITH BUTTER, BY WEIGHT FROM MILK

FIG. 4.

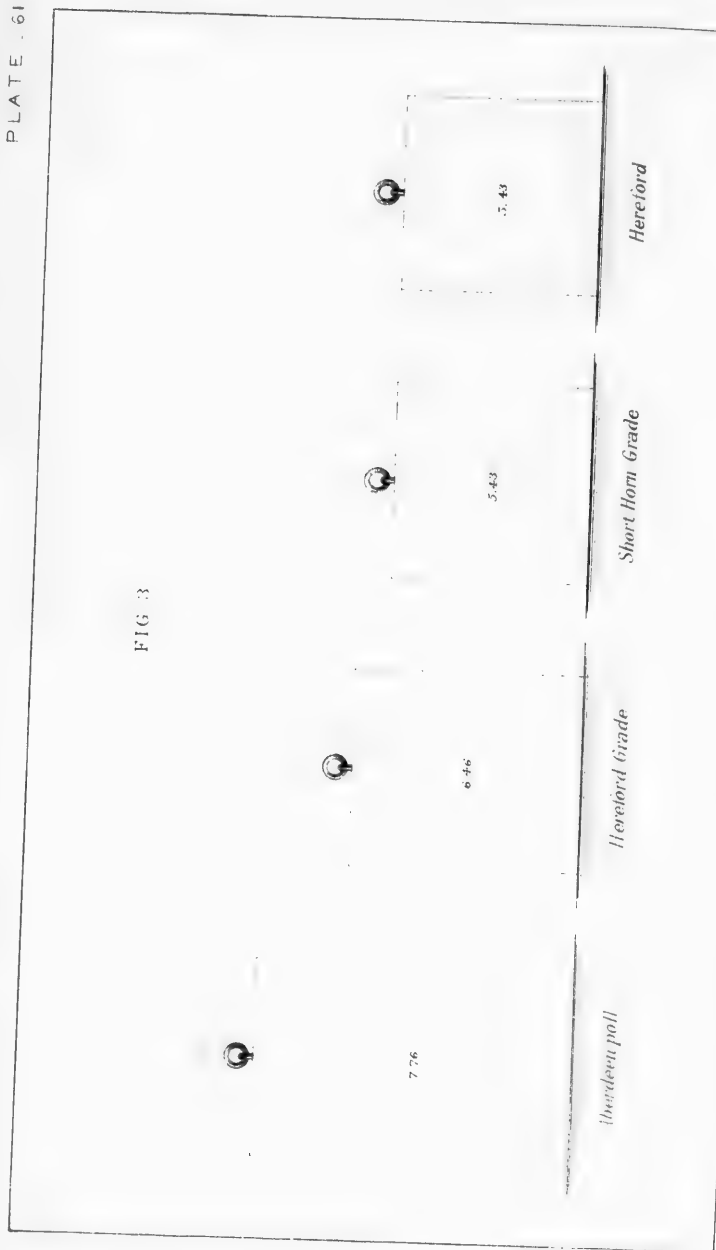


MILK, CREAM & BUTTER TESTS
 AGRICULTURE OF SPECIFIC GRAVITY OF MILK WITH ACTUAL WEIGHT OF CREAM

MILK, CREAM & BUTTER TESTS

AGREEMENT OF SPECIFIC GRAVITY OF MILK WITH ACTUAL WEIGHT OF CREAM

FIG 3

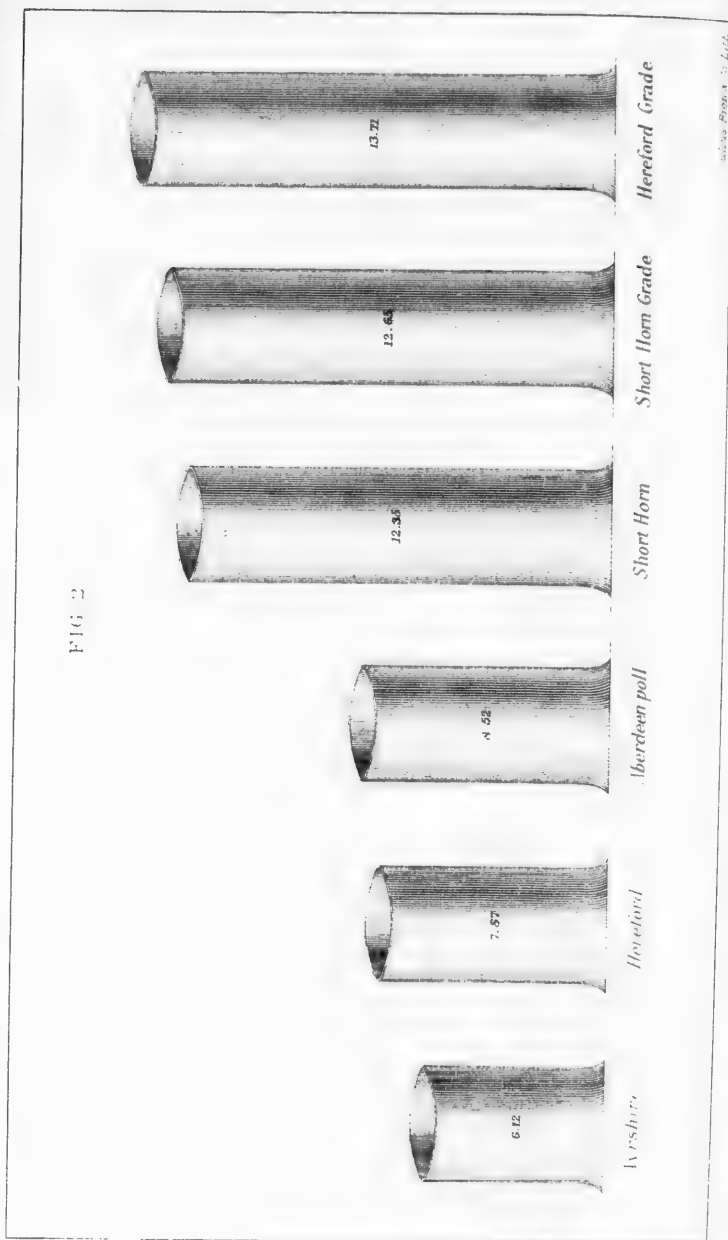


Adapted from K. S. Clark

MILK, CREAM & BUTTER TESTS

MILK, CREAM & BUTTER TESTS

FIG. 2



Arshire	Hereford	Aberdeen poll	Short Horn	Short Horn Grade	Hereford Grade
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1915-1916

MILK, CREAM & BUTTER TESTS

FIG 1



MILK, CREAM & BUTTER TESTS

GRAVITY OF MILK FROM DIFFERENT BREEDS OF CATTLE

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Name of breed

Canada ..
Shorthorn ..
Hereford ..
Aberdeen grad
Hereford grad
Shorthorn grad
Devon ..
Galloway ..
Ayrshire ..

Name of breed.

Canadian ..

Shorthorn ..

Hereford ..

Aberdeen grade.

Hereford grade.
Shorthorn grade.

Devon ..

Galloway ..

Ayrshire...

CATTLE IMPORTS FROM THE UNITED STATES NOT PROBABLE.

I am not inclined to think that any considerable importation of cattle from the United States is likely to occur, as the only requirement here is for No. 1 thoroughbreds, and the wide-awake shippers are keenly criticising foreign stock, of which, owing to their trans-Atlantic trade, opportunities of making selections from the most famous herds are not lacking.

I have pleasure in attaching to this report a plan of the model stock building, Experimental Farm, Guelph, trusting that it will not be considered extraneous to the subject, and an illustrated test of the milk, cream, and butter producing capacity of several breeds, made by Professor Brown, under the direction of the Ontario Government.

H. C. BUFFINGTON,

Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Chatham, October 3, 1883.

Special statistics concerning cattle in Southwestern Ontario.

Name of breed.	Annual average yield of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Live weight.			Age at maturity.	Weight of meat at maturity.	Color.
				Cow	Bull.	Ox.			
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Months.	Lbs.	
Canadian	4,800	25	11½	950	1,700		24	950	Variable.
Shorthorn	2,550	22½	12	1,550	1,700 to 2,000		22-24	1,000 to 2,000	Do.
Hereford	2,340	24	11½	1,300	1,500		28	1,300 1,500	Do.
Aberdeen	2,350	25	11½	1,300	1,500 1,000		30	1,300 1,500	Do.
Hereford grade	3,570	24	7	1,100			32	1,300 1,500	Do.
Shorthorn grade	3,060	24	11	1,450			22-24	1,450	Do.
Devon	2,800	23	16½	1,050	1,200 1,400		25-27	1,000 1,200	Chiefly red.
Galloway	2,470	25½	9½	1,250	1,300 1,500		30-34	1,250 1,300	Chiefly dark.
Ayrshire	5,250	24	11½	1,000			32-36	1,000	Variable.

Name of breed.	Description of breed.	Origin of breed.	Product.			
			Labor.	Meat.	Milk.	Cheese.
Canadian ..	Small, quick, wiry.	Native stock with perhaps a strain of Durham.	Good	Flesh good but too small.	Fine	Good.
Shorthorn ..	Good frame; quick grower.	Booth-Bates families.	Fair	Excellent and heavy.	Very fair ..	Do.
Hereford ..	Good feeders; plump.	.....	Good	Flesh good; too light.	Moderately good.	Do.
Aberdeen grade.	Well built; not considered hardy stock.	.....	Indifferent ..	Rather light ..	do	Very good
Hereford grade.	Plump and rugged.	Cross	Good	Light but excellent.	Very good ..	Superior.
Shorthorn grade.	Large; rapid grower.	Cross on native or grade cow.	Strong	Large and good.	Excellent ..	Very good.
Devon	Small boned and plump; easily fed.	.....	Too small ..	Fine but light	Good	Indifferent.
Galloway ..	Thick-set and hardy.	.....	Good	Rather light ..	Fair	Good.
Ayrshire ..	Small, clean limbed, plump.	.....	Fair	Too light ..	Superior ..	Do.

Topography : Altitude, very little above the level of Lake Saint Clair, which is about 570 feet above sea-level. Mean temperature for 1882 was 44°. A very small difference is noticeable in a record of thirty years. Mean for June, July, and August, 61.3°; December, January, and February, mean 23.1°.

Soil : Twenty per cent. alluvial; clay-loam, 30 per cent., in some places 3 to 8 feet deep; clay, 16 per cent., 3 to 4 feet deep; 25 per cent. sandy loam and gravelly.

There is absolutely no soil or substratum in this locality which can properly be designated as stony. There is considerable lowland and some marshes not fit for growing grain. Most of the land has a heavy yellow or blue clay substratum; cannot state the per cent., but by far the greater area may be thus classed. A small part of the soil near the lakes is light, and has gravel or sandy soil as a substratum.

Cultivated grasses : Timothy, 40 per cent.; clover, 40 per cent.; grass, &c., 20 per cent. The principal grass crops are timothy and clover, some corn for feed broadcast, and a small quantity of various grasses; large quantities of wheat and oat straw are fed in winter.

Methods of housing, feeding, &c. : Most cattle have run of barn-yard and straw-stacks, and are only housed when being stall-fed. Open sheds (a square usually) afford them good shelter. In some places young stock are badly neglected in the matter of housing (vide the plan inclosed). No system of feeding; young stock are allowed to feed themselves, and attention only begins (save with fine animals) when it is intended to fatten them. The most approved breeders cross the best attainable of male thoroughbreds on common or grade cows. No bull is suffered to go to his own progeny. A second or third cross is preferred to a first.

Handling products : No trouble; plenty of buyers, who are always traveling the country to make up cargoes for British markets and local butchers, keep up the prices.

CATTLE IN PRESCOTT, ONTARIO.

REPORT BY CONSUL SLAGHT, OF PRESCOTT.

CHARACTERISTICS OF THE VARIOUS BREEDS.

The production of a superior class of cattle, such as are found among the best herds in this consular district, has been successfully accomplished by a careful selection and use of thoroughbred bulls only, and experience has proved that the Durham and Hereford stand pre-eminent, the Hereford being the larger and capable of attaining to a higher standard in weight as beefing stock. But for smallness of bone and early maturity the Durham is the favorite, and apparently more numerous. The Durham bull is serviceable for breeding purposes at fifteen months. The Ayrshire, or a well selected Canadian cow served by a Durham bull, produces excellent results, giving a high grade of animal, combining most desirable qualities for the dairy and also for beefing stock. It is, however, by good feeding and proper housing that any preference is claimed for the Durham; if the animals are exposed to cold and hardship, or insufficiently fed, the Hereford will surpass his competitor. The cows at present comprising these herds are largely of the Ayrshire strain, and under judicious management the average product of milk per cow is 5,000 pounds during the season, and when made into cheese 10 pounds of milk is required for 1 pound of cheese, 500 pounds of full cream cheese being placed to the credit of each cow in the herd annually. For richness of milk the prize is conceded to the Jersey cow. The special excellence of this herd is maintained by the use of a thoroughbred Durham bull, and 20 per cent. more butter is claimed for this herd from a given quantity of milk over any other herd in this district. The Canadian cow is placed by competent authorities here as having been originally imported from Normandy. These were good milkers, and partook very much in appearance of the Jersey and Alderney breeds. By cross breeding they are now classed at one-fourth

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Shorthorn. They are very enduring, and do good service in the dairy, having also fair beefing qualities. The Galloway breed are represented here to a very small extent. These cattle are appreciated more for their labor than for milking or beefing qualities, being strong, hardy animals, with heavy necks and shoulders. The thick covering of heavy black hair which they possess forms a noticeable protection against this cold climate; they are also without horns. Thus protected and unencumbered they appear to be peculiarly adapted for labor in the unbroken forest.

DISTILLERY-FED CATTLE FOR EXPORT TO ENGLAND.

There are 1,200 head of cattle fattened for market annually at this place. They are known as distillery fed, and are placed in the feeding stall in November. Only such animals as are of good frame, three to six years old, weighing at the time 1,000 to 1,100 pounds per head, are selected for this purpose. The daily routine of feeding begins at 6 o'clock in the morning—all the hay they will eat in two hours. At 8 a. m., mash from the distillery, quite thick with meal, is given them. At noon mash again, and at 2 o'clock p. m. hay. At 6 p. m. the troughs are filled with mash, and the cribs with hay, which is an abundant supply for the night. This system of feeding is accompanied with good housing, and produces very choice beef. The usual time occupied in feeding as herein described is from six to seven months, and when these cattle are taken from the feeding stall their weight is 1,500 to 1,600 pounds per head. The valuation on the spot will average \$100 each. They are at once shipped to England, and the cost of transportation to Liverpool, including insurance, attendance, and food during the voyage, does not exceed \$22 per head. Their valuation in the English markets are from \$140 to \$150 per head, netting a handsome profit.

The prices for young cattle here are the following: For bulls eighteen months old, \$75 to \$100; heifers, yearlings, \$20 to \$30 per head. Such stock is not supposed to be pure, although classed as high grade.

EXPORT TO THE UNITED STATES.

Transportation to the United States by direct and continuous railroad connections at very small cost. The twelve to twenty-four hours occupied in transit from here to prominent marts in the United States dispenses with the additional cost for care and food. Buyers from the United States are constantly in Canadian markets for young cattle. Beeves, however, are seldom exported to the United States from this district.

In view of the important question of profit or loss to the dairyman when the animal passes the age, or for other cause, when it shall cease to contribute profitably to the dairy, attention is then directed to its beefing qualities, and what appears to be most wanted is a grade animal that will attain to the greatest weight in the shortest time, and not be injuriously affected by a change in food or climate. These desirable qualities may be fully relied upon as characteristic of the Durhams and Herefords. Therefore it is my humble opinion that these are the best breeds to export to the United States.

HARRY L. SLAGHT,
Consul.

UNITED STATES CONSULATE,
Prescott, April 8, 1884.

General statistics.

Name of breed.	Annual average yield of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Live weight.		
				Cow.	Bull.	Ox.
Ayrshire.....	Lbs. 5,000	Lbs. 25	Lbs. 10	Lbs. 900	Lbs. 1,500	Lbs. 1,400
Durham.....	5,000	25	10	1,100	1,600	1,700
Hereford.....	5,000	25	10	1,100	1,600	1,700
Jersey.....	6,000	10	(*)	800	1,300	None.
Canadian.....	4,000	25	10	900	1,500	1,400

Name of breed.	Age at maturity.	Weight of meat at maturity.	Color.	How long bred pure.	Origin of breed.	Product.		
						Meat.	Milk.	Cheese.
Ayrshire.....	Years. 5	Lbs. 600	Red and white..	Years. 7	Scotland.....	\$28 00	\$30 00	\$35 00
Durham.....	4	800	do.....	5	England.....	35 00	30 00	35 00
Hereford.....	5	800	do.....	8	do.....	35 00	30 00	35 00
Jersey.....	4	None.	Fawn.....	10	Island of Jersey..	None.	150 00	None.
Canadian.....	4	600	Red.....		Normandy.....	28 00	30 00	35 00

* None made.

† Milk and cream.

Annual increase, 10 per cent.; for the dairy, 75 per cent.; for the butcher, 25 per cent. Excess of home demand exported to England and United States.

Topography: Altitude, 300 feet; mean temperature, 42.31°; summer, 66°; winter, 18.44°. Soil: One-half loam, one-fourth clay, and one-fourth sandy, &c. Substratum: One-third limestone, one-third granite, and one-third gravel, &c.

Cultivated grasses: Two-thirds timothy and one-third clover.

Methods of housing, feeding, &c.: Wooden stables; a stall for each animal. They are cleaned and carded daily. Good beds, sawdust being freely used as an absorbent. Grazing in summer; hay, oatmeal, and barley meal in winter; salt three times a week. Calves come into profit at fifteen months to two years of age. Very little butter exported from this district. Local demand for milk and cream is large. Raising of calves is extensively engaged in. Cheese is exported.

CHEESE DAIRYING IN HASTINGS COUNTY, ONTARIO.

REPORT BY CONSUL PRINCE, OF BELLEVILLE.

CATTLE AND THEIR IMPORT AND EXPORT.

There are very few pure-bred cattle in this district. I could find but two or three persons who made any pretensions to raising a better than ordinary grade. There are now, however (having been introduced within a few months past), several fine Durhams and Ayrshires, claimed to be absolutely pure, and a movement is being made for the introduction of some other breeds, and more interest in and attention paid to the breeding of pure stock, all of which, in the future, will materially change the character of the cattle here.

I find that in the county of Hastings, comprising the largest part of my district—population nearly 50,000—the census returns show live stock as follows:

Cattle.....	31,985
Hogs.....	10,534
Sheep.....	29,268
Horses.....	11,472

The cattle are mostly Shorthorn grades and common Canadian, the "grade" and Canadian, so called, being the greater proportion, probably nineteen-twentieths. None are raised or bred here for export. The most of them are of a small size, some, when crossed with the Ayrshires, weighing less than 1,300 pounds. The purer the breed the heavier the stock. Few are slaughtered for market—merely sufficient for the ordinary home demand—the cattle being of light weight. The heavier meats come from districts west. None are drawn from the United States, nor are any exported thither of any importance. Such as are exported go to England. I find that in the last five years not over \$20,000 worth of cattle have been sent to the United States from this district, and these at long intervals and of ordinary grades.

CHEESE MAKING.

The main interest here in this connection is the dairy—the entire product in fact going to the cheese factories. The yield is about \$28 per animal, on the average, over and above what is used in the family, though in one instance a party who has a fair herd of Durhams and Ayrshires says his yielded him \$40 per season for each cow over and above such as he used for his own family.

I have analyzed the returns of three of the principal cheese factories, and I find as follows: Milk to each pound of cheese, No. 1, 9,602 pounds; No. 2, 9,870 pounds; No. 3, 9,510 pounds.

Paid each patron or stockholder, per standard (of 3,000 pounds) of milk, which is supposed to represent the average season's milking: No. 1, \$28.37; No. 2, \$26.49; No. 3, \$30. The average price for cheese was about 9.90 cents.

I was unable to find any one who kept such accounts as would enable him to get at the product of his cattle in other directions, labor, meat, &c., or for the balance of the year. As stated, the main volume of the product goes to cheese.

The northern portion of this county (Hastings) is admirably adapted for grazing, and the beef and mutton and butter and cheese are of a better quality than the southern. The water in the northern (Lawrentian) portion is pure, while that of the southern (Silurian) district is very hard.

FRED'K W. PRINCE,
Consul.

UNITED STATES CONSULATE,
Belleville, December 15, 1883.

Special statistics of cattle in the Belleville district.

Breed.	Color.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.	Weight of meat at maturity.	District.
Durham	Red, and red and white.	Pounds. 22½ to 24	Pounds. 9½ to 9½	Pounds. 1,400 to 1,500	Pounds. 800 to 900	Belleville.
Ayrshire	do	22½ 24	9½ 9½	1,300 1,400	800 900	Ontario.
Ordinary grade	White and red..	24 25	9½ 10		600 700	

Remarks.—The yield of milk during the "season," as called, at the cheese manufacturers, averages 3,000 pounds; for exceptional cases in pure breeds (see report herewith), 4,000 pounds. Until quite recently, say two years, very few absolutely pure

Live weight.		
Cow.	Bull.	Ox.
Lbs. 900 1,100 1,100 800 900	Lbs. 1,500 1,600 1,600 1,300 1,500	Lbs. 1,400 1,700 1,700 None. 1,400

Product.		
Meat.	Milk.	Cheese.
\$28 00 35 00 35 00 None. 28 00	\$30 00 30 00 30 00 \$150 00 30 00	\$35 00 35 00 35 00 None. 35 00

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breeds in district. There are but the two crosses from Durham and Ayrshires in this district. The milk all goes to the cheese factory, except such as is used in the family. From pure-bred stock, \$40 per season has been realized; the average, as indicated by cheese factory returns, is \$28. The Durham matures at three years of age.

Topography: The southern portion of this district is from 250 to 1,300 feet above level of the sea; the northern from 500 to 2,000 feet. Mean temperature, 47.7°; highest (September), 98°; lowest (February), 16°. Soil: Alluvial, loam, and clay; sandy in patches only. Substratum: Southern portion of district, Silurian limestone; northern, Huronian and Laurentian granite; bowlder clay in small portions. Timothy and clover are the cultivated grasses.

Housing, feeding, &c.: The cattle are housed in inclosed sheds. During the milking season roots are the feed; when not, dry straw and grain once a day.

CATTLE IN THE CARLTON COUNTY, ONTARIO.

REPORT BY COMMERCIAL AGENT ROBBINS.

The consular district of Ottawa embraces a large extent of country, with a great variety of soil and climate; but for the purposes of this report I shall confine my investigations to the county of Carleton, of which Ottawa is the county seat.

TOPOGRAPHY.

As the published official reports fail to show the mean temperature of Ottawa I have selected two of the nearest stations, viz, Pembroke and Cornwall. Pembroke is west and north and Cornwall south and east of Ottawa, and the results given below will indicate the temperature of this district.

Mean temperature in each quarter of the year 1881.

Stations.	Winter.	Spring.	Summer.	Autumn.	Year.
Pembroke.....	°	°		°	°
Cornwall.....	15.2 17.7	51.9 52.5	67.4 67.4	33.5 36.4	42.01 43.59

SOIL.

The soil of Carleton County varies in the several townships, but clay, sandy and black loams predominate. In this immediate vicinity there is a good deal of limestone rock. All the cultivated grasses do well, timothy and clover being the ruling classes. Of the improved land, about one-half is reported as first class for agricultural purposes; about one-quarter second class, and the remaining quarter third class. There is considerable swampy land as yet unredeemed, as also a good deal of land so rocky as to be unfit for profitable cultivation. The county is generally well watered.

AVERAGE PRODUCTION.

The average production of grain, &c., is reported as follows: Fall wheat, 20 bushels per acre; spring, 15 bushels; barley, 30 bushels; oats, 35 bushels; rye, 20 bushels; peas, 20 bushels; corn, 25 bushels;

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Summer.	Autumn.	Year.
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potatoes, 150 bushels; turnips, 450 bushels; other root-crops, 420 bush-
els; hay, 1 ton per acre.

ALTITUDE.

Ottawa Harbor, at foot of Rideau Canal, in the city of Ottawa, is
121.75 feet above tide-water mark at Three Rivers, a point midway
between Quebec and Montreal, and from which official measurements
are taken.

EXPLANATION.

The foregoing figures are taken from official reports, and the follow-
ing are based upon results derived from actual experience had and ex-
periments made with the different grades of cattle in this county, se-
cured (by personal interview) from cattle raisers and experts, and which
are believed to be reliable:

Special statistics concerning cattle in the Ottawa district.

Name of breed.	Sex.	Age at maturity.	Size at maturity.	Weight at maturity.	Color.	How long bred pure.	Origin of breed.	Average pounds of milk daily from March 1 to November 1.	Average pounds of butter from March 1 to November 1.	Milk to pounds of cheese.
		Yrs.	Feet.	Lbs.		Yrs.		Lbs.	Lbs.	Lbs.
Durham	Bull	5	5½	2,000	Red and roan.	25	England			
	Cow	4	4½	1,400 to 1,600	do	25	do			
Devon	Bull	5	4	1,500	Red	7	do	20	4	12
	Cow	4	4	1,300 to 1,400	do	7	do	18		
Ayrshire	Bull	5	4	1,500 to 1,600	Roan	25	do			
	Cow	4-5	4	800 to 900	do	25	do	30	1	12
Cross between Durham bull and native cow.	Cow	2-3	4½-5	900 to 1,000	Red and roan.		Canada	30	1	12
Common or native.	Cow	2-3	4	800 to 900	All colors.....		do	25	2	12

CONCLUSIONS.

There are a few Jerseys and a few Galloways in this district, but o
the pure bloods the Durhams are the favorites. According to my best
information the predominant class of cattle in this district is a cross be-
tween the Durham bull and common or native cow; they mature early,
are good feeders, hardy, excellent milkers, of fair size, good beefers,
and hence profitable.

The friends of the Devon claim that equally good results follow from
the cross of a Devon bull with the native cow, and, as a matter of fact,
all crosses of the pure bloods with the native cow greatly improve the
stock. She seems to have the power and habit of perpetuating the char-
acter of her male consort rather than her own. Especially is this the
result of the first cross, but which is not so marked or distinctive in
subsequent issues.

R. B. ROBBINS,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Ottawa, October 3, 1883.

CATTLE IN THE SIMCOE DISTRICT.

REPORT BY COMMERCIAL AGENT JAMES.

The principal breeds of cattle here are the Durhams and the Durham grades, and some Ayrshires to a limited extent. The best method of exportation, and the one mostly followed, to the United States from this section is by rail to Buffalo, and to the old country they go principally by rail to Montreal and Quebec, thence per steamer. The animals mostly exported are Durhams or Durham grades, on account of size of carcass. The prices of fat cattle vary according to demand, bringing from 3 to 5 and 6 cents per pound, live weight. For thoroughbreds the prices range from \$100 to \$1,000, and often prices that seem fabulous. The number of cattle in the county of Norfolk, Ontario, in which my district principally lies, is somewhere in the neighborhood of 25,000, the largest percentage of which are grades. About 40 or 50 per cent. are bred for the dairy. The stock, I think, has slightly decreased, owing to the shipments to the United States and the old country. The supply is in excess of the home demand. As regards the breeding of thoroughbred Durhams it is found that animals of superior breeding are raised here, and are annually bought up at very large sums and exported, and have been able to carry away prizes from those bred at home. I have had all the answers, as far as possible to obtain them, given in the enclosed lists, and trust that such may prove satisfactory.

HENRY M. JAMES,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Simcoe, December 7, 1883.

Special statistics concerning cattle in the Simcoe district.

Name of breed.	Average yield of milk per day.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.			Age at maturity.
				Cow.	Bull.	Ox.	
Durham and Durham grade	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Years.
Ayrshire	30 25	25 to 30 25 30	10 10	1,200 900	2,000 1,600	1,600	4 or 5 5 6

Durham and Durham grade: These are large stock, of red or roan color; originally from England, and have been bred pure for many years. Weight of meat at maturity is about one-fourth less than live weight. In Durhams the following strains are good milkers: "Isabellas," "Rose of Shrons," and "Sanpariels," and in grades any of their issue.

Ayrshires: This breed is of medium size, red and white in color; originally from Scotland, and have been bred pure for many years. Weight of meat at maturity one-fourth less than live weight. They are good milkers, and excellent for butter and cheese.

This district is in Norfolk County, Ontario.

Topography, &c: Altitude: 140 feet above Lake Erie, or from 700 to 716 feet above sea level. Mean temperature: 1875, 43° 2; 1876, 43° 4. Soil: One-half sandy and clay, one-eighth clay, and three-eighths sandy, &c. Substratum: One-eighth limestone, three-fourths clay and sand, and one-eighth gravel, &c. Timothy and clover are the cultivated grasses.

Housing, feeding, &c: Cattle are generally kept in stalls in stables. Cut hay and straw with chop, &c., and roots, such as turnips, mangels, and beets are fed. They are either thoroughbred, or in case of grades bred to thoroughbred bulls.

PROVINCE OF QUEBEC.

CATTLE-RAISING IN QUEBEC.

REPORT BY CONSUL PARKER, OF SHERBROOKE.

INTRODUCTORY.

I have the honor to transmit herewith such answers to the inquiries made by the Department of State relative to the various breeds of cattle, amount and quality of products, and the methods of handling and disposing of the same, as I have been able to glean from the breeders and dairymen and stock-growers of this portion of the province of Quebec. I am aware that in many particulars the report is incomplete, and that in others results are only approximated. But I have found considerable difficulty in securing even the limited information thus compiled.

A few general observations will, I think, serve to give a better understanding of the cattle industry in the Eastern Townships of the province of Quebec, and of such features thereof as may be of interest to the herdsmen and farmers of the United States than any tabulated statement can do.

THE NATIVE OR FRENCH CATTLE.

The native, or French cattle, as these are called, form the basis upon which the various crosses with the imported breeds are made. These cattle are not large, but they are hardy, light eaters, and yield fair quantities of good, rich milk, well calculated for profitable use in the manufacture of butter and cheese. Cattle-breeders who have given the subject careful attention are of the opinion that these native cattle, which were introduced by the early French colonists, belong to the great Channel family and are nearly related to the Jerseys and Guernseys.

THE BEST DAIRY CATTLE.

Senator Cochrane, who owns and operates at Compton, near Sherbrooke, the best appointed cattle-farm in Canada, possibly, excepting the great Government establishments at Guelph and Rougemont, has found by long experience with the best-known breeds that the Jerseys are by far the most profitable and best suited to this climate of any of the highly-bred cheese and butter producers. The offspring of Jerseys crossed upon the native Canadian stock are better for ordinary farm use in places where good shelter and thorough care in winter are not always attainable. But good results can only be secured here by properly housing and feeding stock during the long, cold winters.

CLIMATE OF QUEBEC.

In a climate where the mercury often sinks to 25 and 30 degrees below zero, and occasionally to 40 degrees below, the importance of proper shelter and food must be fully realized.

CATTLE FODDER IN QUEBEC.

The seasons being too short for corn to mature other food products must take its place. Among these hay and roots are the principal.

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J. JAMES,
Commercial Agent.

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Bull.	Ox.	Age at maturity.	
		Pounds.	Years.
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1,500	1,500	5 or 6	

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The country produces timothy, clover, and red top, or herd grass, in great abundance. Before the development of the cattle industry, immense quantities of hay were exported to the United States. But now much of the hay crop finds a market with the cattlemen, and the shipments from this immediate locality show a corresponding decrease. The best roots are the white Swede turnips, sugar-beets, and carrots; the turnip being the favorite. For young cattle these are boiled, pulped, and mixed with chopped clover, hay, and either oil cake or cotton-seed meal; while they are sliced or fed whole to mature animals. This is, of course, on well-managed cattle ranches; among ordinary farmers they are simply fed whole in connection with hay. It is probable that Canadian cheese and butter owe more of their excellent quality to this diet of rich and succulent roots, and to one other cause, than to the peculiar breeds of the milch cows that yield the milk and cream from which they are made. The one other cause is the frequent rains during the summer and fall, which keep the grass always green and tender until the frosts kill it down.

THE MOST SUITABLE BREEDS FOR QUEBEC.

The Canadian minister of agriculture (Mr. Pope) is also largely engaged in breeding fine cattle at Cookshire, in this consular district, and the Dominion Cattle Company, of which Hon. W. B. Ives, member of Parliament for the counties of Richmond and Wolf, is the manager, has its headquarters here. Besides these there are other breeders of thoroughbreds, and a great many extensive raisers of good-grade stock for the butchers and exporters. The united testimony of all these tends to the conclusion that the Polled Angus or Aberdeen stock and the Herefords are the best calculated to produce good beef cattle in this climate.

They are hardy, large, mature early, and their meat is of the best. Breeders also regard them as much the best for crosses with the native grades here, and under certain circumstances, in the South and West also.

THE JERSEYS VS. NATIVE FRENCH CATTLE.

As before remarked the Jerseys and Jersey crosses with native cattle are most popular here for dairy purposes. Mr. Cochrane and other breeders of large experience regard them as being, in many respects, superior to the Guernseys, Ayrshires or Devons. The ease with which they are kept in good condition and the richness of their milk are the points urged in their favor. Some breeders have, at times, cherished preferences for the Guernseys on account of their superior weight, but further experience has taught them that their inferiority to either of the three great beef-producing breeds is too palpable for them to be regarded with favor for butcher's stock, while their smaller yield of milk and butter will not permit them to become rivals to the Jerseys for dairy purposes.

It would not be fair to the native stock of cattle to fail to add here, that in the qualities required for the farm dairy, the Canadian cattle, even without the benefit of favorable crosses are really strong. They are thoroughly acclimated, give fair quantities of milk, and the yield of butter and cheese is good. A competent dairyman estimates that the average Canadian cow, with ordinary treatment, will yield 5 quarts of milk daily for at least six months in the year, after which it will slowly fall off.

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DISPOSITION OF CATTLE AND CATTLE PRODUCTS.

As to the disposition of products, beef cattle are largely consumed at home. The people of this section of Canada make use of a great deal of meat, mostly beef and mutton, pork being used comparatively little. Large numbers of fat cattle are shipped to England and Scotland, and a small number reach the markets of the United States.

Butter is made by the families of farmers, and either printed or made into rolls for the local trade, or packed in tubs for exportation or to supply the home markets during the latter part of the winter and the early spring months, when the cows are mostly turned dry. Cheese is made by farmers' families and in small factories, and sold to local dealers or to exporters. Much Canadian butter and cheese reaches the markets of New England, its superior quality enabling shippers to pay the duty of 4 cents per pound to the American Government, and still find ready and often profitable sales among our people. The shipments of Canadian butter and cheese to England and Scotland, where they are highly prized and bring fairly remunerative prices, have been growing larger year after year, and in the last three years have doubled annually.

CONCLUSION.

I have thus endeavored to present the opinions of the stockmen and dairymen of this section of Canada, and the results of their varied experiences—gleaned from numerous conversations and interviews with them—uncolored by any notions of my own. I sincerely hope that the record may contain something of value to the stock growers and farmers of the United States.

BENJ. S. PARKER,

Consul.

UNITED STATES CONSULATE,
Sherbrooke, December 19, 1883.

Special statistics concerning cattle in the eastern townships of Quebec.

Name of breed.	Annual average yield of milk.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.		
				Cow.	Bull.	Ox.
	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.
Canadian	1,600 to 1,000	10	5	700 to 1,200	900 to 1,500	800 to 1,400
Shorthorn .....	.....	.....	.....	1,200 1,800	1,800 2,400	1,700 2,400
Hereford .....	.....	.....	.....	1,200 1,800	1,800 2,400	1,600 2,300
Polled Angus or	.....	.....	.....	.....	.....	.....
Aberdeen .....	.....	.....	.....	1,200 1,800	1,800 2,400	1,600 2,300
Jersey	2,000 to 2,400	9	5	700 1,100	800 1,300	800 1,300

Ereel.	Age at maturity.	Weight of meat at maturity.*	Color.	Origin of breed.
Canadian	Years. 3	Pounds. 700 to 1,500	Fawn, roan, spotted ..	Supposed to have been in the Channel Islands.
Shorthorn	2	1,200 2,400	Red, roan, white	England.
Hereford	2	1,200 2,400	Red and white	Do.
Polled Angus	2	1,200 2,400	Black	Scotland.
Jersey	2	700 1,800	Fawn	Island of Jersey in the English Channel.

* These are gross weights; subtract at least one-fourth to obtain net weights.

Topography, &c.: Altitude, 500 to 1,050 feet above sea-level; mean temperature (estimated), 35° above zero; summer, 60° above; winter, 10° above. There are no records kept here except those kept by the Grand Trunk Railroad. I did not know this in time to secure correct figures from the Grand Trunk general office at Montreal. The soil varies in different localities so that it is fairly correct to designate mixed, loam, clay, and sand, in equal proportions.

Cultivated grasses are timothy, clover, and red top.

Housing, feeding, &c.: The cattle are kept in stalls and loose boxes on ground floors of barns and sheds. Special care is taken on the breeding farms for thoroughbred stock. Cattle are housed in basements of main barns with hay and straw in lofts, root cellars near at hand, &c. The feed consists of hay, turnips, corn, barley, oatmeal, bran, oil-cake, cotton-seed meal, &c. Timothy hay fed whole, but clover hay chopped and mixed with pulped turnips, also with meal, bran, and oil-cake for young stock. Roots fed whole or sliced for mature stock. Good grade cattle are made by crossing Short-horns, Hereford, or Polled Angus on to native Canadian stock. The best dairy stock is pure Canadian or pure Jersey or crosses of the two. Much care is taken by breeders to keep their strains pure. Much of the beef products are shipped alive to England and Scotland and much is consumed at home, while a fair per cent. goes to the markets of the United States. Beef cattle are generally well handled. Much butter and cheese is produced. The cheese is exceptionally good and the butter about equal to the average butter of the United States.

CATTLE IN THE GASPE BAY DISTRICT.

REPORT BY CONSUL HOLT.

Little attention has been given to the improvement of the breed of cattle on this coast, consequently they are small and inferior, and of no value to those who are interested in the selection of animals for breeding purposes. They consist mainly of mixed breeds from Polled cattle from the Magdalen Islands, and Jerseys and Canadian, of an average live weight of from 4 cwt. for the cow to 6 cwt. for the ox, and yielding about 100 pounds of butter per cow annually.

GEO. H. HOLT,
Consul.

UNITED STATES CONSULATE,
Gaspé Basin, October 6, 1883.

CATTLE IN PRINCE EDWARD ISLAND.

REPORT BY CONSUL WORDEN, OF CHARLOTTETOWN.

I have the honor to forward herewith the form which accompanied the cattle circular of July 18, 1883. Many causes have operated to hinder its compilation, and now it is with considerable doubt as to its availability that I send it to the Department.

It is only within a few years that the farmers of this province have begun to comprehend the advisability of improving the native cattle by importations from England.

A farm was purchased by the local government some years since, and a number of pure and well-bred cattle put upon it. Their progeny have, from time to time, been sold at auction, and gradually the grade of the cattle now bred on the island is being improved. This farm is maintained at the expense of the local government. No pains are taken to give the farming community the advantage of the stock raised. At present the character of the stock is not equal to that of Ontario,

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but, from observation, I consider it superior to the general average of Quebec.

I doubt if the feeding of cattle receives the same amount of care that is given to the system in Ontario. During the summer the island is admirably adapted for grazing, and it seems as though a trade in cattle with the United States might be of as much importance as is the trade in the other products of the province. The Boston market would seem to present a favorable opening for this branch of industry. At present no cattle are sent to the United States from this consular district. A few buyers of sheep and lambs find their way to the island.

W. A. WORDEN,

Consul.

UNITED STATES CONSULATE,

Charlottetown, Prince Edward Island, August 7, 1884.

Special statistics concerning Prince Edward Island cattle.

Name of breed.	Annual average of milk.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.			Weight of meat at maturity.
				Cow.	Bull.	Ox.	
	Pounds.	Pounds.	Pounds.	Lbs.	Lbs.	Lbs.	Pounds.
Shorthorns.....	3,000	30	10	1,400	1,800	1,600	800
Ayrshires.....	5,800	.....	.....	1,000	1,400	1,400	600
Grade Shorthorns.....	6,600	.....	.....	1,300	1,700	1,500	700
Other grades (crossing between the Ayrshire and Gurnsey bulls and the native cows).....	5,500	.....	.....	1,000	.....	1,300	600

Remarks: The Shorthorns are well shaped; colors, white, roan, and red. They were originally imported from England, and have been bred pure seven to twenty-five years. The Ayrshires and Grade Shorthorns are similar to the Shorthorns, except that they are of mixed colors. Other breeds are of mixed colors, medium shape, and have been bred pure for one hundred years; origin not known.

Topography, &c.: Altitude, 36 feet. Mean temperature, 39.33°; summer, 47.58°; winter, 31.07°. Soil: Loam, clay, and sand. Substratum: Sandstone, clay, and gravel. Cultivated grasses: Timothy and clover.

Housing, feeding, &c.: The cattle are kept tied up or in loose boxes during winter of six months. Hay, timothy and clover, roots; turnips, mangels, potatoes, grain, oats, and barley are fed. Grain is housed or stacked, and thrashed in barns; hay chiefly housed.

MEXICO.

CATTLE-BREEDING IN NORTHERN MEXICO.

REPORT BY CONSUL-GENERAL SUTTON, OF MATAMOROS.

Preliminary.—A detailed and reliable account of the breeding-cattle in Northern Mexico, as called for in the circular and memoranda, is a very difficult task. No previous data being available, I have had to visit the "ranchos" and inquire directly of "rancheros." Having selected the cattle I desired, they were photographed, measured, and weighed, and as full a description given as possible.

Origin.—In all the histories of Mexico and of individual States which I have examined, they are spoken of as the cattle of the country descended from those brought over by the Spaniards.

Breeds.—Roughly speaking, there is only one breed, but in this there are variations, showing that at least three breeds were originally imported, the Longhorns, the Shorthorns, and the Polled cattle.

In Northern Mexico the first is the most common, and is, so to speak, the general class. In the same herds with the Longhorns are to be found a considerable number of shorter-horned cattle, and occasionally a few Polled cattle. The first are very large-boned, immense, gaunt beasts. The Shorthorned are a little shorter and broader. The Polled cattle are nearly like the Longhorned in general build.

Uses.—These cattle, as a whole, are only good for and only used for, beef and labor. Milk and cheese are only made in small amounts for local consumption.

Milk.—In this city cow's milk is sold along with goat's milk, and rather exceeds the latter in quantity. In most of the other cities and towns of Northern Mexico, cow's milk is usually scarcer and more goat's milk is used. The increase of foreign population has increased the demand for cow's milk. I know of no attempt to increase the milk-producing qualities of cows. The cows are "corraled" at night, milked in the morning, and herded during the day on the open pastures.

A fair average cow will give about 4 quarts of milk per day for three months. After three months the amount diminishes and the quality deteriorates, so that milking is finally stopped at about six or eight months after the calf was dropped.

The milk in good seasons seems to produce a light cream, and is reasonably good if got pure and clean. Venders of milk sell it at so many cupfuls for 6 cents. The number of cups varies with the season, but the price averages from 5 to 15 cents per quart. It lacks the taste and quality found in good American cow's milk produced from the rich and juicy grasses in the United States.

Butter.—Butter making is almost unknown, although there are some "ranchos" up-river where American "rancheros" have dairies and make considerable butter for local consumption.

Cheese.—A small amount of a sort of cheese is made and has a limited sale. It is usually made into round flat cakes weighing about a pound. It resembles what is locally called "Dutch cheese" in some parts of the United States. The general get up of the article was not inviting

enough to encourage me to take a second taste. In general it may be said that while there are thousands of cattle within sight, a glass of milk is a difficult thing to obtain, and butter and cheese are unknown.

Varieties of breed.—On the lowlands the cattle grow larger. The hoofs spread out, the limbs are thicker, the horns are longer, and the animals generally adapt themselves to their surroundings. In the high regions the hoofs are smaller and tougher; the animals are agile, sure footed, and very hardy.

Color.—In all this region the color is numerous. Perhaps red is the most prevalent color, with the spotted or "paint" cattle. Besides the plain colors, beautiful glossy hair. Cream-colored cattle have very

Grasses, &c.—All these cattle run wild, and feed the year round on the wild grasses and bushes. The grasses are very numerous. In this State the most common is the mezquite grass. Besides this are the gama grass, buffalo grass, bunch grass, zacahuizte grass, Bermuda grass, and a large number of others. After a rain, fifteen or twenty varieties are often found along the road within a short distance.

Other foods.—Besides the grasses, cattle feed upon the leaves and beans of the mezquite bush or tree (*Algarobia glandulosa* of Gray). These beans are very fattening. The nopal and other varieties of the cactus are also utilized in certain seasons as food for cattle. In some cases these are gathered in piles, and most of the thorns burned off, so that the cattle can eat them more readily.

Water.—Water is afforded by the various lakes, rivers, and pools. The value of a pasturage is largely dependent upon the amount, location, quality, and permanence of the water supply. In this State, particularly near the Gulf or river, are in the rainy season large lagunas of fresh water. Some of these remain through the longest drought. In the higher country water is scarcer, and in dry seasons many cattle die from lack of water. Rivers in Northern Mexico are comparatively scarce, and the lakes are still scarcer. This is a condition which obtains all over Mexico, and, as the rainfall is not evenly distributed through the year, renders irrigation necessary for agriculture. Sufficient moisture for grass and water for stock is often unattainable and renders stock-raising on many otherwise fine pastures very hazardous.

Tanks.—In some sections, dams have been constructed across *arroyos* and other depressions in the soil where the water is held in reserve. To some of these the cattle come long distances to drink. It is thought that this system of tanks would, if properly carried out, bring much idle land into use. In Texas, Capt. Richard King, of Santa Gertrudes, Nueces County, who has one of the largest stock "ranches" in the world, has made a large number of these tanks with excellent results. Either from their effect, or from other causes, Captain King thinks that in his section, between the Nueces and the Rio Grande, the rainfall is increasing and becoming more evenly distributed. With this change he also notes the advance of the mezquite bush, which now partially covers hundreds of thousands of acres which, ten or fifteen years ago, were open plains. The same changes, though less marked, are noticed in the lowlands of this State.

IMPORTS OF IMPROVED STOCK.

In this State I learn of one importation of some twenty head, mostly Durhams, with a few Jerseys. The importer informs me that he cannot as yet give any reliable statement of the results. A very few improved



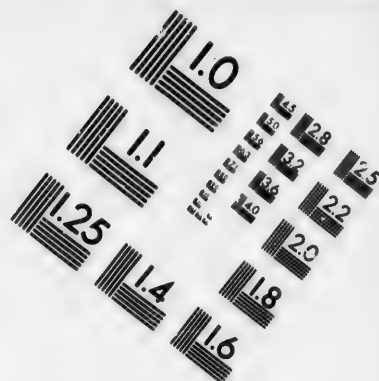
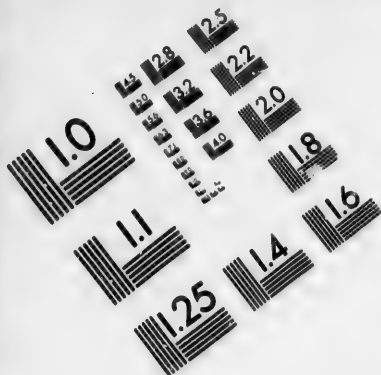
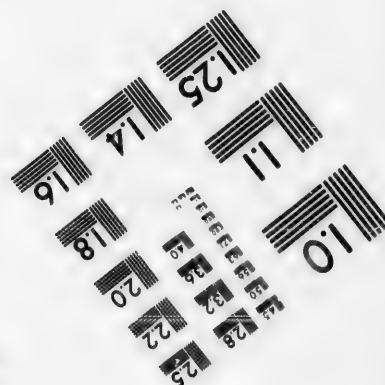
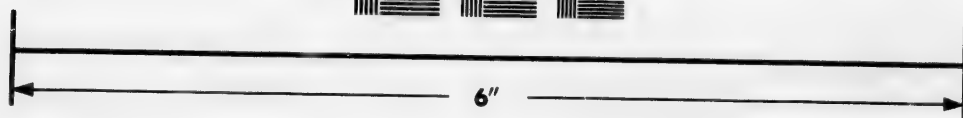
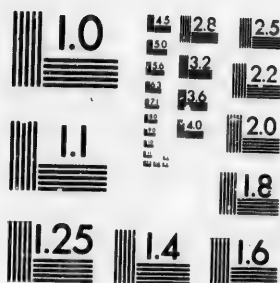


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stock are reported by Consul Scott, of Chihuahua, as having been imported into that State. I have heard of a few other importations along the frontier.

METHODS OF BREEDING.

Cattle graze on the plains the year round. Generally they keep pretty close to one portion of the range, changing somewhat with the time of the year and the supply of water and pasture.

Bulls.—The bulls run with the herd all the year. Calves are dropped all the year round, but most generally in March, April, and May.

The bulls serve cows at eighteen months, but are most effective from three to six years. After that age they get so heavy that they are not so serviceable. They are then castrated, and broken to the yoke or killed for beef. The bulls are not usually changed from herd to herd, and hence breed in and in, to the great deterioration of the stock.

When full grown and ten or twelve years old they are very large, very wild and fierce. A few are used for bull fights during fairs and find their way to the slaughter-house afterwards. To illustrate the disposition of the wild bulls it is stated that south of Soto de la Marina, in this State, some roads are at times impassable, because the bulls attack anything which comes in their way.

Oxen.—Bulls and oxen are used indiscriminately for work purposes. One of each are often yoked together. The males are not castrated until two or three years old. The "rancheros" think that they grow larger and faster by this method. They are often simply twisted or pounded. As a result they are usually very staggy in appearance and, as their final destination is the slaughter-house, the term "bull beef" comes home to those who eat beef here with peculiar force. The horns of oxen are longer than those of bulls and often reach a great length. They are very strong, hardy animals. They are worked with a yoke made of a straight stick of wood, in which are cut slight curves for the neck. These sticks are lashed to the head and horns by means of raw leather thongs. The pole of the two-wheeled cart is lashed directly to the yoke stick. They are guided by a driver who goes in front and carries a long pole with an iron brad in the end. This he usually allows to rest behind him on the yoke. He accelerates their pace by punching the offending ox. A turn is made by punching one animal in the ribs and striking the other over the head. A full stop is made by hitting both over the head and getting in their way, kicking their noses, &c. They will usually stand patiently so long as the goad is resting on the yoke in front of them. In muddy weather or on the road they are guided from the cart by punching, hitting, and the voice.

Cows.—Heifers take the bull at about two years of age and cows usually drop one calf a year in March, April, or May. The calves run with the mother until she turns them off, occasionally returning to take a share of the milk supply for the next calf. With good years, when the grass and water are abundant, the average annual increase in a herd is about 66 per cent. Droughts or hard winters will reduce this increase. Cows are never milked except near towns or where a few are selected from a "rancho" to supply the milk needed. These are then milked daily, with or without the calves, for a few months, then turned out and their place supplied with fresh ones. Many of these cows grow to an immense size, and the horns are as long or occasionally longer than those of the oxen.

Branding.—A very important proceeding is the branding, which occurs generally in the months of November, December, and January.

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Mezquite posts are set upright so as to make a large "corral," into which the animals are driven by horsemen who have rounded them up. These are very interesting occasions. One set of horsemen bring up one herd, and by dint of shouts, lassos, &c., finally secure them in the "corral."

All those which have no brands are lassoed, led out, thrown down, and branded with the owner's mark. This brand is usually some letter or letters of the name, but is often only a design. The idea is to make a mark, usually on the left side or hip, which cannot grow out or be blurred or obscured by another brand. Besides the main brand is an ear brand, and some cut is usually made in the ear.

When sold many sellers round up the cattle and add another or selling brand. All these brands are matters of record. Cattle cannot be moved from one district (in Tamaulipas) without inspection.

When sold the seller invariably gives a written bill of sale, on which the brands are "painted" or rather written. To illustrate more fully the appearance of the cattle after branding I give herewith some specimens of such brands on file in this office.

Wild cattle.—Besides the cattle which are regularly guarded and which are comparatively tame there are in the southern part of this State many cattle belonging to large "ranchos" which are absolutely wild. Many of these are never branded, are fierce, and roam about in their section unmolested by man. A very intelligent gentleman who has a large ranch in that portion of the State estimated that there might be 50,000 such animals in this State.

Castrating.—With a few "rancheros" the castrating is done when the stock are branded, but the great majority leave this until they are three years old. In other cases they are "twisted" or pounded. It is claimed that a worm causes some trouble when stock are castrated, but this is denied by the most intelligent stock-raisers. The latter tell me that there is no danger in castration, and that it should be done at six months, and that this method gives a better growth, finer stock, and much better beef.

Quality of beef.—The beef is dark red, and when reasonably fat is juicy and fairly tender. As beeves are never fed even for slaughter, and as so much is bull beef or very staggy, it is not so good as it might easily be made. In hot weather the beef is very watery and the weight of the carcass is greatly diminished by drying after slaughter.

Near Soto la Marina the beef is said to be finer than at any other point in Mexico. The grasses are particularly nutritious and abundant, and the prevalence of salt in the atmosphere keeps the stock in good health and gives a finer taste to the meat.

Retail prices.—The prices vary in different cities and in different seasons. In this city (Matamoros) where some fourteen are killed daily, the price of the carcass is about 5 cents per pound Mexican coin, and beefsteak, say, 10 cents American coin.

How beef is sold.—Most of the beef is cut into thin strips, the bone being left out. Formerly a roast or steak could only be bought by previous arrangement, so that it would be properly cut. The American idea has, however, prevailed, so that one can now get meat properly cut for steak and other purposes. More than half is still sliced off into thin strips to be dried for future use. All the stands in the market have the price per pound printed above. This price is regulated by the city which owns the market building and rents the stands. While the price is thus fixed very few if any buy by the pound. The buyer picks out what he wants and negotiates to see how large a piece or how many slices he can

get for 12½ or 25 cents. A small piece is almost always thrown in as a "pilon" or gift. The meat not sold is sliced, salted, and hung out to dry in the sun.

Beef at various ages.—From six months to three years the beef is comparatively good and tender. From three to seven years it is very tough. After the seventh year it again begins to grow tender, and is at its best in the fourteenth year.

Age.—Cattle mature at five or six years but continue to fill out a year or two longer. With fair care cattle live fifteen to eighteen years. They rarely live more than twenty years.

VALUE OF MEXICAN CATTLE FOR THE UNITED STATES.

Breeding cows.—The chief value of these cattle, so far as regards the United States, is in the cows. These when exported to the plains of Texas and the West make the basis of the finest herds in the world. As I stated in a recent report (see Consular Reports No. 31, July, 1883), these cows breed very rapidly and surely. They and their descendants retain the large size and red color of meat. They grow rapidly, are hardy, wild enough to be good "rustlers," and the second cross with good bulls makes the best grass-fed beef that goes into our Eastern cities. The first thought of the Western ranchman is to get Texas cows, which are the same as the Mexican cows, except as improved by better handling, for the foundation of his herd.

If prices are too high in Texas he comes through to Mexico.

Experience has shown that with one or two crosses these cows produce much finer and more profitable beef cattle than do the average cows in the United States. They are not so domesticated or effeminated, and hence are better adapted to the rough ways of ranch life. It is not at all likely that they would be of service in improving our breed of milch cows.

Beef cattle.—When prices make it profitable large quantities of young cattle are exported to the United States to be driven to the ranges to grow and fatten for our markets. These cattle are simply frames, and, fattened on the juicy grasses of our West, make good beef at four and five years of age.

Duties.—All cows, heifers, and bulls entered for breeding purposes are free of duty in the United States. Beef and other cattle pay 20 per cent. on the original cost price.

Values.—The prices of all kinds of live animals as cattle, horses, mules, sheep, goats, have greatly increased within a few years. Herds of cattle, which five years ago were slow sale at \$4 ahead as they ran, now bring \$10 to \$15. Ranchmen hold cattle so high that buyers have fallen off greatly and the movement is slight at present.

Export duty.—The demand in the United States sent a good many buyers to this State last year. The export of cattle so alarmed the State authorities that they passed a law levying an export tax, amounting to \$2.50 per head on cows and \$1.25 on other cattle.

This tax applied if cattle were moved from one Mexican State to another. Large transactions were broken off and sales for a time almost entirely suspended. By a late law this tax has been reduced to \$1 per head on cows and 47½ cents on other cattle.

Markets.—The principal market and that which takes perhaps two-thirds of the surplus is the interior of Mexico. After supplying the small local demands about one-third goes to the United States through Texas, New Mexico, and Arizona. Some have been shipped by vessels

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to Havana, and in the future this may be an important market for these cattle.

Driving.—They are driven in herds by horsemen, getting food and water *en route*. Those for the interior are fattened outside and marketed in the city of Mexico, San Luis Potosi, Guanajuato, &c.

Those for the United States are used for breeding or fattened and shipped East by rail. The opening of railways in Mexico will cause some shipments to be made by rail.

Costs, &c., of driving.—The cost and risk of driving vary greatly with the route, season of the year, grass, handling, and condition of the stock. From the interior of this State to this frontier the country is comparatively open, very level, and in good seasons has plenty of water and grass. My averages show the losses on this route not to exceed 4 per cent.

In the upper country, where grass and water are scarcer and the road much rougher, the losses have reached 25 per cent. on the route from the place of purchase to the border. The cost per head from San Fernando to this city, not including export dues, has amounted to \$1 per head. This included going, buying, and returning pay of drivers, losses *en route*, &c.

The best routes are more or less direct lines to the nearest American town.

EXPORTS TO UNITED STATES.

The total of live animals exported from Mexico to the United States for the year ending June 30, 1881, was \$314,272, and for the following year, \$455,917, values in United States coin, nearly all of which passed over this border. Of these amounts probably more than one-half were cattle.

IMPORTS OF AMERICAN CATTLE PRODUCTS.

In the year ending June 30, 1882, Mexico imported from the United States (values in United States coin):

Description.	Quantity.	Value.
Horned cattle..... head..	793	\$18,602
Leather..... pounds..	2,562	861
Manufactures of leather:		
Boots and shoes..... pairs..	60,610	85,327
Saddlery and harness.....		34,497
All other manufactures of.....		20,344
Beef:		
Fresh.....	None.	
Salted, or cured..... pounds..	13,626	1,501
Butter..... do.....	104,597	26,105
Cheese..... do.....	44,408	6,885
Condensed milk.....		1,363
Tallow..... pounds..	543,009	42,768
Total.....		248,252

MEXICAN DUTIES.

The following are the import duties on American cattle and cattle products:

Articles.	Principal duty.	Weight duty on 100 kilograms (220 pounds), gross.
Horned cattle	Free.	
Leather, net weight	\$1 43	\$1 01
Leather, manufactures of, not specified, gross weight	80	73
Boots or half boots:		
Cow-hide of more than 18 centimeters (7.00 inches) of sole .. per dozen ..	16 50	1 60
Of calfskin, or patent leather of same dimensions .. do ..	27 00	1 60
Shoes:		
Leather, all classes, for men, same dimensions .. per dozen ..	7 00	1 60
Leather, low, for children, not exceeding 18 centimeters .. do ..	5 00	73
Saddles, all classes ..	(1)	50
Harness for carriages:		
Common, gross weight	80	73
Fine, gross weight	2 00	73
Meats:		
Preserved, of all classes, in juice or dry (not including extract of meat), net weight, including in this the weight of the inner wrapper, kilograms ..	72	50
Smoked or salted, net weight .. kilograms ..	24	50
Butter, net weight, including in this that of the inner wrapper .. do ..	24	50
Cheese, all kinds, net weight, including in this that of the inner wrapper, kilograms ..	14	50
Condensed milk ..	(1)	76
Tallow, all classes, net weight .. kilograms ..	06	50

* Kilogram = 2½ pounds.

† Fifty-five per cent.

In addition to above duties, add 2 per cent.

The butter was probably entirely oleomargarine, and generally a most disreputable article. In the United States I use butter very freely, but here, even the finest quality of so-called butter which I can import, especially from New Orleans, is so poor that I hardly taste it once a month. A small amount is used in cooking. It is not likely that butter would keep good long enough to make the journey unless packed in ice

CATTLE CENSUS OF NORTHERN MEXICO.

The total of cattle can only be estimated. Statistics cannot be obtained except in some cases, and they are chiefly remarkable for their unreliability. In a former report I estimated the number of cattle in Northern Mexico at 1,500,000. In this State, I am informed that the list handed in to the State treasurer gave the total at about 180,000, but a counting up by sections and "rancheros" gives nearly or quite 750,000. Consul Campbell forwards a similar list from Nuevo Leon giving the total at 127,738. That list is probably more nearly correct, as the State is smaller, and cattle-raising is not the chief industry. Perhaps 250,000 would be a fair estimate of the number in that State.

The following is a rough apportionment:

Tamaulipas	750,000
Nuevo Leon	250,000
Coahuila	225,000
Chihuahua	225,000
Sonora, part	50,000
Total	1,500,000

Of this total hardly more than 1 per cent. are ever milked. This total has been considerably reduced within the past three years. The inte-

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Principal duty.	Weight duty on 100 kilograms (220 pounds) gross.
Free. \$1 43	\$1 01
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The mountain ranges in Northern Mexico are of the same formation as the Rocky Mountains in the United States, of which they are simply the southern continuation.

The soil is strongly impregnated with limestone deposits; near the coast are found large saline deposits. The "vegas" or low bottom lands are alluvial deposits. Some, particularly near the Rio Grande and Gulf of Mexico, are black, waxy, and very fertile. Others in the higher plateaus are sandy or gravelly. The ranges, or grass lands, are thinly covered with soil, with, in many sections, large quantities of stones.

The coast portion of this State, Tamaulipas, extends back, say, 50 miles and is particularly good for cattle. The first plateau is considered good pasture for horse. Farther back the country is divided into valleys by hills and mountain ranges. The nopal and other varieties of the cactus family are found all over Northern Mexico. There are large sections where stones, cactus and thorny shrubs cover the thin soil, so that

it will support nothing but goats. Much of this barrenness is caused by lack of regular rainfall.

CLIMATE.

The average temperature of the coast lands of Tamaulipas is about 77° Fahrenheit. The coldest weather is usually in January. Near Matamoras frosts occur every winter, and occasionally a little snow falls. Farther down the coast the winters are much milder. The greatest heat is usually in June, when 100° Fahrenheit in the shade is occasionally reached. The temperature ranges in the nineties for some four months, May, June, July, and August.

The difference between maximum and minimum daily heat is about 10° to 15°. The northers, a strong wind from the north, with or without rain, blow at intervals in the colder months. These begin light and warm in September and come, say, two per month until April. The most severe ones are usually in December or January. Their duration is from three to ten days. In the intervals the weather is comparatively cool, say 70° to 80° in the middle of the day. For ten months the wind is from the south. Without this wind the climate would be almost unendurable. The annual rainfall is about 33.65 inches, nearly one-half of which often comes in the autumn. Up river the extremes of heat are much greater, the temperature sometimes reaching 117° Fahrenheit in the shade. The absence of the trade wind with the great heat makes the climate very trying. In the winter the northers blow with great force, and the temperature goes lower than near the coast. On the higher plateaus the climate is more equable. Some portions, like Saltillo, have a magnificent climate.

ELEVATIONS.

The coast portion of Tamaulipas is from 100 to 200 feet above the sea level.

This city, Matamoras, is 165 feet; Nuevo Laredo, 806 feet; Piedras Negras, 1,461 feet; mouth of Pecos, 2,027 feet; near Presidio del Norte, 2,779 feet; near Paso del Norte, 3,684 feet. These elevations are those given in Major Emory's boundary survey. The Mexican Central Railway gives the height of Paso del Norte at 3,756 feet; Chihuahua City 4,672 feet; Lerdo, 3,764 feet. The late Consul Wadsworth gives the height of Saltillo in Coahuila at 5,217 feet.

CATTLE IN COAHUILA.

The sudden death of Consul Wadsworth of Saltillo, which occurred on the 8th instant, has been a serious loss in the preparation of this report. At the time of his death he was preparing a report not only upon the points suggested in the circular but upon others which I had asked of him. He was to have had photographs of cattle taken in Saltillo to show more plainly the difference between the same animals on the coast and on the plateaus. His zeal and ability were such as to warrant me in expecting a very valuable report.

CONSUL SCOTT'S REPORT.

The report from Consul Scott, of Chihuahua, herewith transmitted, is of special interest, because from his long residence there and ownership of such cattle he is particularly well informed.

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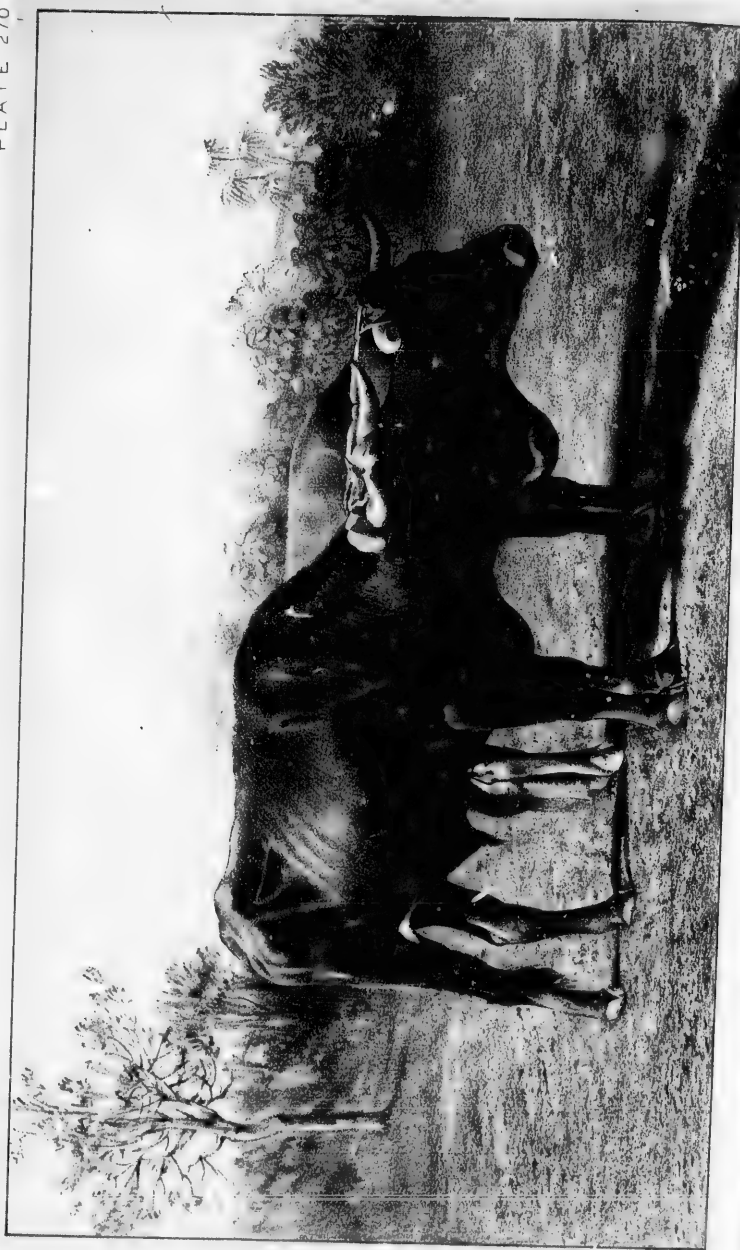
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OTHER REPORTS.

I beg to call particular attention to the reports transmitted from Consul Campbell, of Monterey, and Vice-Consul Pridgen, of Piedras Negras, and Consul Smith, of Nuevo Laredo.

ILLUSTRATIONS.

I give herewith four views of cattle. The first is the average typical cow. She was about seven years old, of dark brown and black colors. She had been milked about three months. Although comparatively tame it was with difficulty that she stood lassoed long enough to get the view. The second view is the yoke of oxen; both dark red in color. The "off ox" was castrated at two years, and was about eight years old. The "near ox" was castrated at about four years, and was decidedly staggy. The horns of the latter had been sawed off. The yoke and goad are shown in the illustration. The third view is of a "paint" bull, red with large white spots. He was about six years old, and though wild stood fairly still when driven into a corner of the "corral" and guarded by four or five men.

These views were taken at the "Matanza" (slaughtering place) of Mr. Enrique La Pierre, a resident of this city, who owns a "ranche" some 14 leagues from the border. They were all carefully selected by him so as to be fair average animals of their respective classes.

ACKNOWLEDGMENTS.

As Mr. La Pierre refused to accept any payment for his trouble, I desire to express here my obligations to him, not only as to the views given but as to much valuable information concerning cattle.

I also beg to express my indebtedness to Don Feliciano San Roman, of Brownsville, Tex., for information. Mr. San Roman has a large cattle "ranche" near Soto de la Marina in this State.

WARNER P. SUTTON,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
Matamoros, December 31, 1883.

CATTLE-RAISING IN CHIHUAHUA.

REPORT BY CONSUL SCOTT.

With two or three exceptions the herds of cattle in this State are native Mexican, which are in most respects closely allied to the ordinary Texas cattle of a few years ago. They have been raised in much the same manner, running wild upon the plains, frequently wandering off from 50 to 75 miles from the hacienda whose brand they bear; which brand is supposed to be respected by neighboring haciendados, and I must say that property is generally secure from theft.

The laws regulating cattle-rearing are as good as can be found in any country, and any cattle stealing is punished with hard sentences.

There are no cattle in this State that would be worthy of importation to the United States for male-breeding. As a general rule the herds have been seriously injured by long inbreeding and a surplus of poor

bulls on the haciendas. The cows are much superior to the bulls, and those crossed with Shorthorns, Herefords, &c., make very desirable animals. The most marked improvement occurs in the first cross.

The nature of the climate (Chihuahua being within what is termed the "summer rain belt") demands a class of cattle that will travel a long ways to water, when necessary eat the grass as they can find it, as no other food is ever prepared for them. Such a thing as a hay-stack or straw-rick I have never seen in the State.

No shelter is ever prepared for them except to probably plant some cottonwood along the ditches and streams of the farms. In many instances nature provides this shade.

The climate is dry from October 15 until the following June, when the rainy season sets in. During July, August, and September the vegetation grows very rapidly, and the plains soon become covered with a rich growth of fine grass of the beech, buffalo, and gramas kinds.

The cows are fine breeders, but I consider this more on account of climate than of breed.

Chihuahua is a table-land sloping east from the foot-hills of the Sierra Madre Range (where the plains are about 6,500 feet above the sea) to plains and valleys divided by small ranges of mountains from 4,000 to 5,000 feet elevation.

These cattle, when driven to Colorado and Kansas, fatten on the nutritious grasses of those States very rapidly, and make good meat for market.

The cows kept for dairy purposes are few indeed. They are poor milkers, not averaging more than a half gallon a day, and are only milked once in twenty-four hours.

But little butter and cheese are made. Butter is worth 62½ cents per pound, and a very ordinary article of cheese 15 cents per pound. Butter pays a Federal duty of 24½ cents a kilogram and cheese 14½ cents a kilogram, and in addition to this they both pay a State and city duty.

The State of Chihuahua (86,000 square miles) contains about two hundred and fifty thousand head of cattle and not a fence, except around some planted grounds. About twice a year each hacienda gathers its cattle, which they term a "Rodeo." To these rodeos the neighboring farmers are invited, and when the cattle are all in a bunch each set of men select the stock of their respective farms and drive them home.

The climate is all that could be desired for a stock country. It seldom snows and is free from the cold north wind, termed "Northers" in Texas.

The percentage of calves is large and would be larger if they paid more attention to the bulls, and killed off the old ones, which are only in the way of service of their more vigorous juniors.

If some attention were given to proper food for the cattle during hard seasons; if hay were cut and stacked convenient to water, well-bred, grass-raised bulls from Texas introduced, &c., there would be a marked difference in the cattle.

Sufficient crossing has been done to show the great benefits which will result from systematic cross-breeding.

The Polled Angus has not been tried in this State as yet. Their color is against them in a clear climate where the sun's rays are so hot.

There have been some small herds driven out of the State into New Mexico and Arizona, principally for breeding purposes, which I am told have done well. They go out via El Paso, Tex.

They handle the cattle roughly, even killing them at times in running them over the range. In this manner the cattle become wild and fail to make that flesh which they otherwise would.

LOUIS H. SCOTT.

Consul.

UNITED STATES CONSULATE,
Chihuahua, Mexico, November 1, 1883.

CATTLE IN THE STATE OF NUEVO LEON.

REPORT BY CONSUL CAMPBELL, OF MONTEREY.

DIFFICULTY OF OBTAINING STATISTICS.

I have the honor to transmit a report on cattle in the State of Nuevo Leon, Mexico, as per instructions from the Department of State July 18, 1883.

Owing to the great difficulty of procuring exact and reliable information as to facts relative to cattle in this State my report will be necessarily meager.

I have interviewed numbers of the most intelligent and reliable gentlemen of the city, many stockmen of different parts of the State, besides more than a dozen butchers of Monterey, from all of whom it has been impossible to elicit the desired information. Some of them had only a general vague idea, and most of them none at all. The butchers could not tell the average weight of any class of live-stock, nor the difference between the net weight and live weight.

After boiling down the many conflicting guesses, and mixing in my own observation, which of necessity has been limited, I have gathered together a few facts which I think can be relied on.

THE TOPOGRAPHY OF THE STATE OF NUEVO LEON.

There is comparatively a small portion of the State utilized for stock-ranges. The northern part is generally too dry and poorly watered by

streams, besides being covered with the stubby and thorny chaparral which overshadows the grass to such an extent as to render it unfit for grazing cattle. The middle and western, and a large part of the south of the State are divided by mountain ranges into narrow valleys, which are used for the purpose of cultivation, leaving the eastern and southeastern portions for raising cattle to any extent.

There are very few extensive ranches in the State, and even the lands in these divisions devoted to grazing purposes are generally overgrown by chaparral, rendering it extremely difficult for stockmen to corral their cattle in order to count and brand them.

THE CATTLE OF NUEVO LEON.

Breed.—The breed of cattle is almost entirely of the old Spanish or Mexican blood. They have large frames, are of various colors and are hardy, good rustlers.

Meat.—The net weight of beef slaughtered for market, I would judge, is about the same as cattle of the same grade and age in the western part of Texas, and the meat is tender, juicy, and of good flavor. The

stock-cattle in the eastern and southeastern part of the State keep in excellent condition the year round, and are generally of fine size.

Work-oxen.—The work-oxen are generally large and well-kept. The native grasses are nutritious and abundant, when not choked out by the chaparral.

NATIVE PREFERRED TO FOREIGN BREEDS.

The stockmen are paying no attention to the importation of foreign breeds, preferring the native stock, which they say are more hardy, better adapted to the climate, and hence better feeders, which is a very important consideration, owing to the difficulties before mentioned.

Cattle are only raised in this State for beef and work stock, and as they already possess the qualities adapted to these purposes they see no reason for a change or any improvement by crossing these with other breeds. The improvement of cows for milk and butter purposes is entirely overlooked and not thought of, although there is ample room for it.

MILK, BUTTER AND CHEESE.

Good milch cows are very rare; in fact you might say that there are none at all. Goat's milk is universally used for domestic purposes, and butter is as rare as manna. Nearly all the butter used is oleomargarine imported from the United States, of a very inferior quality, which retails at 60 cents a pound in Monterey. Of course such being the facts there is no cheese manufactured from cow's milk in this State. A little of an inferior grade is made from goat's milk. All the cheese consumed here is manufactured near Monclora, in the State of Coahuila, and that is not of the best quality. It is retailed here at about 30 cents a pound. I am satisfied that if the stock was crossed by the Jersey, Ayrshire, or some other good milk and butter yielding breed, a very fine milch cow would be the result. But as there is very little demand here for cow's milk or butter, outside of a few hotels, I am afraid it will be a long time before any one will have the enterprise to attempt the experiment.

CATTLE EXPORTS TO THE UNITED STATES.

At least one-third of the cattle of this State have been shipped to Texas or to other States in the last two years, which of course has enhanced their value very much. Two years ago cattle could be bought in this State for an average of \$5 a head; now they command from \$12 to \$14 a head, which has put a stop to large purchases for shipment. It will not compensate any one to buy cattle at the present prices too far from railroad facilities and attempt to drive them through the country any considerable distance. The difficulties are numerous and expensive. It would be cheaper to buy them as near as possible to the point where the prospective ranch is located, even at apparently exorbitant prices. I know of one party who purchased 1,500 head of cattle last spring near Lenares, in this State, and attempted to drive them through the country to a point near Piedras Negras, who lost 500 of them before he reached his destination. Another party started from near the same place to the same destination a month later with 3,500 head and lost 20 per cent. of them, although he shipped the most of them by rail the greater part of the way. These losses were caused by the unreliability of Mexican herders, by which was caused stampedes

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en route, when the cattle would scatter through the mountains, chaparral, and mesquite, getting beyond the control and recovery of the herders; others, for want of sufficient pasturage along the narrow valleys, would give out and have to be left. So by the time they reached their respective localities their cattle had cost them 25 per cent. more than original cost and a world of trouble and vexation.

The cheapest and best mode of exportation of cattle from the eastern or southern parts of this State is to drive them through to this place (Monterey), and ship from here via the Mexican National Railroad, on account of the difficulties and uncertainties and expenses before stated. They can reach Laredo, Tex., from Monterey in eighteen hours.

Cattle census of Nuevo Leon, 1883.

Municipalities.	Number of head.	Value.	Municipalities.	Number of head.	Value.
Abasolo.....	250	\$2,500	Lampazos de Naranjo.....	5,600	\$56,000
Agualeguas.....	450	8,500	Linares.....	3,000	30,000
Allende.....	550	5,500	Los Aldemas.....	2,500	25,000
Apodaca.....	560	5,600	Los Herreras and Marin	3,800	38,000
Aramberri.....	650	6,500	Meir y Noriega.....	450	4,500
Bustamante.....	900	8,000	Mina.....	5,000	50,000
Caderelta Jimenez.....	12,700	127,000	Montemorelos.....	3,000	30,000
Carmen and Ceralvo.....	1,500	15,000	Monterey.....	1,690	18,035
Cienega de Flores.....	500	5,000	Paras.....	1,650	16,500
China and Dr. Arroyo.....	8,200	82,000	Pesqueria Chica.....	1,250	12,500
Dr. Coss and Escobedo.....	970	9,700	Rayones and Sabinas Hidalgo	12,450	124,500
Galeana and Garcia.....	9,000	90,000	Salinas Victoria.....	2,000	20,000
General Bravo.....	6,400	64,000	Santa Catalina.....	400	4,000
General Teran.....	20,200	202,000	San Nicolas de los Garzas.....	238	2,380
General Trevino.....	3,200	32,000	San Nicolas Hidalgo.....	12,000	120,000
General Zuazua.....	480	4,800	Santiago.....	1,900	19,000
Gnadalupo.....	450	4,500	Vallecillo.....	800	8,000
Higuera.....	150	1,500	Villadama.....	1,000	10,000
Hualahuises.....	350	3,500	Zaragoza.....	200	2,000
Irtabide.....	450	4,500			
Iturbide.....	1,500	15,000	Total.....	127,738	1,278,515

AN ENERGETIC DAIRYMAN WANTED.

In conclusion I would state that, if some enterprising dairyman would start the ball by bringing to market pure, rich milk and fresh, palatable butter, it would create a taste among the people for these luxuries and a crying demand before much time for goodly quantities of both.

ROBERT C. CAMPBELL,

Consul.

UNITED STATES CONSULATE,

Monterey, Mexico, November 15, 1883.

STOCK-RAISING IN THE STATE OF NUEVO LEON, MEXICO.

SUPPLEMENTARY REPORT BY CONSUL CAMPBELL, OF MONTEREY.

I have the honor to submit a supplement to my report on cattle in the State of Nuevo Leon.

In regard to cattle I have nothing more of interest to add to my former report on this subject.

This State is generally better adapted to raising sheep, goats, hogs, horses, mules, and asses.

SHEEP-FARMING.

According to the latest attainable statistics, the number of sheep in this State approximate 206,913, the average value of which is \$1 apiece. The breed is almost entirely the common Mexican or Spanish stock. They attain a medium size at maturity, and are generally hardy. They yield about 2½ pounds of wool each to the clip, twice a year, which brings in this market from 12 to 14 cents a pound. Nearly all the wool produced in this State is marketed at Monterey, very little being exported. It is shipped to various factories in Mexico, to be manufactured into articles of wear. The grade of wool is generally coarse, but sheep-raisers are beginning to open their eyes somewhat to the advantages of improving their breed, both for an increased yield of wool and a better grade. But these people advance very slowly and cautiously towards any innovation upon the old and well-known way. A few Texas merino bucks have been imported, but the advantages of the cross is not yet sufficiently apparent to induce many to attempt the experiment at the cost of \$25 apiece for bucks.

The flocks being generally well guarded by shepherds and trained dogs are seldom invaded to any extent other dogs or wild animals.

They are to some degree afflicted with scab, but not sufficiently to claim serious attention.

There are few very large flocks in the State, ranging from three thousand to four thousand, but the largest flock numbers forty thousand. The greatest drawback to sheep-raising is occasional droughts, during which sometimes from 5 to 10 per cent. perish for lack of water. Fresh mutton retails at 8 cents a pound.

GOAT-RAISING.

Goats are about as remunerative as sheep, as they are more hardy, not subject to as many diseases, and can get about better over the mountains and among the thorny bushes with which the ranges are thickly covered.

Near towns and cities large herds are exclusively devoted to the production of milk, as goat's milk is almost exclusively used for domestic purposes and for the manufacture of cheese. The average yield of milk per nanny is 1 quart, which sells at 12 to 14 cents per quart.

Most of the male animals are slaughtered for the market when kids from three to four months old, and are worth 75 cents each. They are of the common country breed, and the improvement of the blood is never dreamed of, though I am satisfied that the Angora would pay most handsomely, even by exporting the Mohair.

HOG-RAISING.

Hogs are not raised to any great extent, as will be seen from the subjoined tabular statement. They, however, pay a good profit. The hogs here are a cross between the Spanish porker and the wild hog of the mountains. They are very hardy, being rarely attacked by cholera or similar diseases.

The average weight of those killed for market is 175 pounds. They are fattened and slaughtered chiefly for the lard, which brings 20 cents a pound. Fresh pork is worth 12½ cents a pound. None is ever cured for bacon. All the bacon used is principally by Americans, and is imported from the United States, and sells at 40 cents a pound; sugar-cured hams are worth from 60 to 75 cents a pound.

About five hogs are slaughtered a day to supply the pork demand of Monterey of 50,000 people. The people are fond of it, but the majority are compelled to eat cheaper meat—beef, kid, and mutton. The greater part of the lard consumed is brought from surrounding haciendas. No disposition is manifested to improve their stock of hogs by foreign importations, such as the Chester, Berkshire, and the like.

HORSE-RAISING.

Horses are raised to a considerable extent when the population is considered. The average price of horses raised in this State is \$13.50 each. They are principally of the *Brancho* breed, of medium size, well shaped, and very durable and hardy.

He is much better suited for the general purposes for which he is needed and used here than the larger American horse. He can travel farther in a day on less water and food than the American horse.

There are, however, a good many large-sized horses raised in the State from imported stallions, and the number will be increased as heavy American plows and general agriculture demand them.

A great many horses, especially mares, have been bought and shipped to the United States this year. I think 25 per cent. of the horses in the State have been purchased and shipped beyond the Rio Grande in the last twelve months.

MULE-RAISING.

All the mules used in the State are raised here. They will average 14 hands high, are generally well proportioned and very hardy. There are some larger mules raised, but very few over 15 hands high. Many have been bought by the Americans and carried into Texas this year. They are used entirely for wagon and carriage purposes here, having never been able to displace the ox from the plow.

THE BURRO.

The burro, or, as he is called in the United States, the ass, though a modest and small animal, occupies a very important place in the industries of Mexico, as is generally the case in all mountainous countries. He is indispensable and can never be superseded by the horse, mule, or locomotive.

Perhaps when aerial navigation is perfected his dominions will be somewhat encroached upon, but even then he will hold an important place in the industries of Mexico. Kind by nature, patient to a fault, economical in his diet, he will eat his allotted rations of cactus at home, and enjoy a modicum of old rags, paper, &c., when he comes to town without complaint. Burdened with loads larger than himself, he submits to the cruel whacks of his master's "baston" without murmur.

He is faithful and true. He bears his rider with unerring step along precipitous mountain ledges, and packs ponderous burdens of gold and silver ore from otherwise inaccessible mountain heights to the valleys below. Fruits and agricultural products are brought by him from "quintas" among rugged hills to the hungry of the cities, and with equal good grace he tugs with his heavy loads of fire-wood from forests high up the mountain sides to warm the shivering denizens of the city and hamlet.

With all his valuable qualities and great utility he is worth only \$5 in the market.

Large droves of the ass are used to transport merchandise from city to village, and from hacienda to town over roads too rugged for wagons.

ROBT. C. CAMPBELL,
Consul.

UNITED STATES CONSULATE,
Monterey, December 3, 1883.

CATTLE-RAISING IN THE STATE OF TAMAULIPAS.

REPORT BY CONSUL SMITH, OF NUEVO LAREDO.

In response to the cattle circular of July 18, 1883, I have the honor to submit the following:

For the purposes of this report inquiries have been made on a territory 150 miles long and 75 miles wide.

THE TAMAULIPAS CATTLE-RANGE.

The features of this territory have often been described, but it may not be amiss to state that the greater part of it is a plain, not strictly prairie, but resembling very decidedly rolling prairie, broken by some ranges of low hills.

Covering this whole territory there is an abundant growth of a short nutritious grass, upon which cattle thrive very finely.

Cattle require neither feeding nor shelter, or what would perhaps describe the ordinary practice more correctly, they receive no care except such as relates to herding.

The soil is for the most part a sandy loam with a substratum of sandstone. Gravel is found on the hills. Clay is found in beds of no large extent. Chalky limestone, which makes excellent lime, is found in some localities.

Water is very scarce and is often found at long distances only, 10 to 12 miles. This is a great drawback to cattle-raisers, it being so that cattle must of necessity be driven several miles to water. A drought means loss and damage to cattle-owners. The drought of the present year, which was exceptionally severe, was absolutely disastrous to many men and seriously decreased the number of animals.

THE EFFECTS OF DROUGHT IN CATTLE-RAISING.

It is estimated that there are now about 40,000 head of cattle on this range. The larger part of these are held by men who have large ranches and own the water they need. Small cattle-owners are largely damaged in time of drought for the scarcity of water, and because the scorched grass is innutritious.

There are not many cattle near the Rio Grande, because of the facility of escape by cattle-thieves across the river.

The old Spanish breed of cattle is the only one found here. It is asserted by stockmen that the heavier breeds of cattle cannot be made profitable, owing to the fact that they cannot endure the long trips to and from water. They say it does not seriously hurt these light-bodied animals to go 10 miles a day for water, but that heavy-bodied animals

would surely break down. Whether or not the supposition is correct, and so far as I can learn it is only supposition, it serves as an effectual objection to the introduction of other breeds. I have no information that any attempt has been made to introduce any other. I can conceive that when some man demonstrates the feasibility of making wells so as to insure a good water supply, the whole question will be changed.

MILK, BUTTER, AND CHEESE.

Milk is only an incident. A man is content if he can get milk enough for his family from ten to twenty cows. A cow is popularly supposed to yield a gallon of milk a day, but half that quantity would be nearer the truth here.

Butter is not made to any extent. The milk, as I have observed it, is very thin and poor. Then the excessive heat renders butter-making difficult.

A little cheese is made, put up in little cakes weighing about a pound. They look as digestible as marble, yet people eat them and live.

THE GRASSES OF TAMAULIPAS.

There are no cultivated grasses. The short grass found on the plains grows under apparently unfavorable conditions, and while there is practically a limited range, there is no motive to cultivate grasses. I do not think that any one of the ordinary grasses cultivated elsewhere would succeed here. I think the excessive droughts which prevail would make their successful cultivation impossible.

CATTLE EXPORTS.

Comparatively few cattle are kept on the ranches to maturity. The sales are mostly of two and three year olds. The price is agreed on between seller and buyer with reference to an average as they stand, the buyer stipulating that they shall be in good flesh.

Only a very small number of fattened animals are driven. For the most part the beeves exported come from small owners near the point of export.

The larger part, almost all the cattle exported, are taken to points in Texas and farther north for fattening. The cattle on the range are neither sheltered nor fed, and are, therefore, in better traveling condition than very fat animals.

No considerable number of cattle have been exported for breeding purposes.

MISCELLANEOUS STATISTICS.

When, as in this year, there have been heavy losses of cattle, and herds must have the number of breeding animals increased, these are drawn from the State of Chihuahua by ranchmen living near the Sierras. No breeding cattle have been imported from the States at this point during the year.

A majority of the work animals are bulls. Some oxen are seen, but comparatively few.

These observations have been very general from the fact the data were impossible. The estimate of numbers of animals is not obtainable.

This immense territory ought to sustain hundreds of thousands of cattle. The land is cheap, and it is plain that intelligent enterprising men would find this a most inviting field.

STEPHEN H. SMITH,
Consul.

UNITED STATES CONSULATE,
Nuevo Laredo, December 2, 1883.

THE BREEDING CATTLE OF NORTHERN MEXICO.

REPORT BY VICE-CONSUL PRIDGEN, OF PIEDRAS NEGRAS.

I have the honor to submit to the Department of State the following report in relation to "breeding animals" of my consular district:

This subject comprises one of the main industries and chief export commodities of Northern Mexico. The fact that Mexican cows and mares are much sought by ranchmen of the United States for breeding purposes, naturally engenders the inquiry as to the reason. It is not because they are larger and finer than American stock, for such is not the case. While the cattle possess large bone and frame, still they are wonderfully deficient in flesh, and having long legs, exhibit entirely too much light underneath them, thus evidencing a great need of flesh and muscular development. Such is no doubt attributable to the fact that they have been too much inbred. It cannot be the fault of the country, for no region under the sun is better adapted to growing stock than Northern Mexico. Climate, grass, water, and the general topography of the country are decidedly favorable to animal comfort and development. True, there are many localities where all kinds of stock are penned during the night, and held under restraint by herders during the daytime to prevent them from trespassing on unprotected farms, and no animal of the cow or horse kind can fully develop under such treatment. They need to range nomadically in order to have anything like a fair chance for size. Be the causes what they may, it is a generally recognized fact that the Mexican stock is inferior to and much smaller than American raised animals. But the Mexican cattle being "acclimated" and healthy, constitute an excellent medium upon which to cross the unacclimated Durhams and other fine bloods. Such cross produces a large, healthy, compact animal that is highly estimated by Southern and Western stock raisers of the United States. The first cross is estimated at 50 per cent. in value above the ungraded; and thousands of beeves of this class (half breeds) are being transported from the prairies of Texas, New Mexico, Kansas, Nebraska, and Colorado to Chicago and Saint Louis, and sent in competition with stall-fed cattle of the Northern and Middle States.

It is the prevailing opinion among stock-growers who are familiar with the various grades of cattle, that a cross between the American "fine bloods" and the acclimated cows of Mexico, imparts to the offspring a quality of health, vigor, size, development of flesh and compactness of form, not common with other grades.

In the interior of Northern Mexico can be purchased many thousand long-boned cattle for breeding purposes, and at reasonable prices.

B. J. PRIDGEN,
Vice-Consul.

UNITED STATES CONSULATE,
Piedras Negras, December 10, 1883.

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CATTLE-RAISING IN SONORA

REPORT BY CONSUL WILLARD, OF GUAYMAS.

BREED.

In reply to circular and cattle memoranda, of July 18 last, received at this office, I have the honor to report that the cattle of this district are the long-horned Spanish breed, of medium size, principally raised on wild pasture, and mainly used for labor and as meat. No butter or cheese, save what is used for home consumption, being produced, and that only in the northern section of the district.

PRICES.

The purchasing price of cattle is as follows: Stock-cattle, from one to two years old, \$8 to \$10 per head; three to four years and over, \$12 to \$18 per head; cows with calves, \$16 to \$30 each.

LACK OF STATISTICS.

No cuts or forms of animals are obtainable here, from the fact that in none of the sections of this district is any record kept of the number of cattle raised, its increase or decrease, nor the causes thereof, what is butchered or exported, nor of dairy products. It is impossible to furnish any statistics on these points.

EXPORTS TO THE UNITED STATES.

Up to one year ago but few cattle were exported to the United States from this district. The number of cattle exported to Arizona and New Mexico from this district for the quarter ending September 30 last, was 5,284, which includes one, two, and four year olds and upward, the most of which are claimed by the purchaser to be for breeding purposes.

IMPORTS FROM THE UNITED STATES.

As regards the means of increasing the exports of meats and dairy products to this district from the United States, at present, there are none.

SONORA AS A CATTLE-RANGE.

There is no reason why Sonora should not be a large and profitable field for stock-raising, as the greater portion of the lands are more fit for grazing purposes than for culture.

A. WILLARD,
Consul.

CONSULATE OF THE UNITED STATES,
Guaymas, October 5, 1883.

CATTLE IN LOWER CALIFORNIA.*REPORT BY CONSUL VIOSCA, OF LA PAZ.*

The rancheros or cattle-breeders of the peninsula are still ignorant of the far superior breeds existing in other countries. The cattle introduced into the territory by the first Spanish settlers have continued to be the propagating breed, and not until a few years ago did the farmers of La Paz and around San José and Cape San Lucas, who are in frequent business communication with the people of Upper California, learn the existence elsewhere of other kinds of stock of greater superiority than their long run out breed of Spanish cattle. Hence the introduction of American breeding stock from California has practically evinced that the offspring resulting from the native or Spanish and American cattle are already giving much better results, and this has created considerable sensation among farmers and cattle-breeders here.

It would be very difficult to ascertain the total number of cattle in the district, and more so the percentage of the two existing breeds. The stock now in the country is not only sufficient for home demands, but also to partly supply the Gulf border States with dried beef and tallow, besides shipping yearly an approximate amount of 12,000 hides to the United States and Europe, notwithstanding the mortality of cattle caused by the scarcity of rains during the previous years.

To make a report of anything near the requirement of the memoranda is beyond possibility.

JAS. VIOSCA,
Consul.

UNITED STATES CONSULATE,
La Paz, December 6, 1883.

HONDURAS.

CATTLE IN HONDURAS.

REPORT BY CONSUL HERRING OF TEGUCIGALPA.

PASTURE LANDS OF HONDURAS.

Large herds of cattle are owned in the departments of Ste. Barbara, Comayagua, and Tegucigalpa, but the largest are held in the departments of Olanchó, Gracias, Yoro, and Colón.

Much of the country of Ste. Barbara presents a surface very uneven, but the whole of it is covered, even the steep rounded hills from top to bottom, with a living verdure, kept fresh and perennial by the mists which hang about the summits, or condense into showers. In the valleys nearly every square league is abundantly watered by pure limpid streams, swift and cool and healthy for cattle. Pine trees scattered over the mountain sides afford all the shade that is needed, and along the water-courses, palms, plantains, bananas, mangoes, and wild figs, with many other plants and trees, grow most luxuriantly. Cattle eat eagerly and fatten quickly on the leaves and tender twigs of the wild fig.

In the departments of Tegucigalpa and Comayagua are a few valleys of large size, one at the city of Comayagua, which has been cultivated for centuries, and was at one time a well irrigated and productive region, where sugar-cane, cotton, maize, rice, and fruits were grown in abundance, but the irrigating ditches have been neglected and the fields have become wastes, whereon the thorny cactus blossoms undisturbed. In the dry seasons the plain of Comayagua resembles certain parts of the Indian Territory, or of Colorado. The soil is composed of washings from the volcanic hills surrounding this great valley, and of ashes from the volcanoes. It is doubtless rich in the mineral elements required for the growth of vegetation, and needs nothing more than water and cultivation to make it produce an abundance of food for man. Now, the grass is scant, dead and brown, yet the live stock crop it freely, and seem to find in it ample nourishment to sustain life without loss of flesh.

The departments of Tegucigalpa, Choluteca, and La Paz are on the arid slope of the Pacific. Here but little rain falls, and the pasturage is, consequently, not so good as it is on the Atlantic Slope, where the winds, laden with moisture from the warm waters of the Caribbean Sea, are forced upward to a higher and cooler altitude and deposit their burden in frequent showers. On the Western Cordilleras the rains come from the winds that blow at certain seasons from the Pacific, and when these rains fall vegetation springs up in most luxuriant profusion over all these hills and in all these innumerable valleys, and every rod of pasture is clothed with grass, fresh and nutritious, upon which cattle quickly regain the flesh lost during the drought. When a long period passes without rain, as has occurred in this region, stock suffer greatly, and sometimes have been known to starve.

The departments of Olanchó, Yoro, and Gracias, surpass all others as grazing regions, as those who have seen them readily concede. These

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broad savannahs, stretching for many miles almost unbroken, are covered by a most luxuriant carpet of grass, and are crossed by hundreds of small streams, rising in the gravelly hills of the gold-bearing district west of the plains. The prairies are constantly refreshed by showers, which, beginning in May, increase in frequency and duration, until in November and early December, when they become almost continuous rains, at times falling copiously every night, for two or three weeks. But fortunately the days are usually clear and pleasant even in these rainy seasons, and though the streams rise rapidly over night, they as rapidly fall during the day.

CATTLE BREEDING IN HONDURAS.

Under such favorable circumstances cattle have ranged for centuries on the plains and *mesas* of Honduras; yet, no attempt appears ever to have been made to improve them by the introduction of improved blood, by the selection of the best animals with which to add to size, strength, or quality, or by other means known to breeders in other lands. There is a want of proper management, and of attention to the easiest and most natural methods. Bulls are not castrated until they are three years old, and men who run cattle estates say that about one-fifth castrated at this age die from the effects of the operation. They believe that more would die if the operation was performed earlier, but they admit that they have never known of a trial of the plan of altering very young animals.

The custom of selecting for slaughter the strongest, smoothest, and best bulls in the herd has doubtless done much to check the natural tendency to the improvement of the breed, which, but for this custom, might have been of great value, under the very favorable conditions existing in the districts named, even without the use of any already improved stock. Calves suck their dams much longer than they are allowed to suck them in the United States. Frequently a cow may be seen standing quietly, while a young calf tugging at a teat on one side, is aided in emptying the udder by a yearling sucking away at a teat on the other side. The spectacle has been seen of a cow suckling a calf, while a heifer stood sucking the opposite teat, and at the same time gave suck to her own newly-born scarcely dried by the sun, it had seen for the first time only an hour or so before.

Notwithstanding these disadvantages the cattle here are profitable to their owners, are of excellent quality for beef, of large size and remarkable docility; and with the modern improved methods of treatment and breeding, they could, of course, be made far more valuable.

DESTRUCTION OF CATTLE BY WILD BEASTS.

There are few dangers threatening cattle in Honduras. Chief among those which do exist is that arising from the existence of the mountain lion, the black tiger, or puma, and the cougar. These animals continue to haunt the mountains and occasionally kill calves or yearlings. The tiger is capable of killing a grown bull. Fortunately the wild beasts are not so formidable as in the north, and consequently losses from their attacks are not very great. The killing of a cow or a yearling or two by wild beasts occasions considerable excitement in the neighborhood where it occurs, and usually results in a hunt which ends in the death of the cattle destroyer.

THE CATTLE SPIDER.

Another drawback to the cattle industry is found in the existence of a spider, which, it is said, rushes out of its burrow in the ground, when disturbed by the tread of stock, and bites the animal at the first tender place it reaches, which is just above the hoof; and this causes fever and inflammation. The fever results in a separation of the hoof from the skin, and the hoof falls off. An early application of aqua ammonia or strong tobacco juice will stop the inflammation and prevent the loss of the hoof.

STOCK RANGERS AND HERDERS.

By law all owners of cattle have the right to graze their stock upon the Government lands; but no one has the right to inclose such lands without first obtaining a concession from the Government of such right or privilege. However, there is little or no need for fencing, as no causes exist here that drive cattle from their accustomed range. No fierce storms sweep over these savannas to drive cattle before them for days without ceasing; no frost ruins the grass; no ice closes the streams; no snow covers the herbage, and shade is furnished by the scattered live oaks, the pines, and by the hills. Stock that has become wonted to any locality will find nothing to tempt or to drive it to stray. This is decidedly favorable to the owner, since he is saved the expense of fencing, and needs but few men to care for his herds. Indeed, it is stated by those who have given the subject much study, that 50 cents per head will pay all necessary expenses of keeping a herd of cattle in Honduras. The native or Indian is by instinct, training, and inclination a *vaguero*, or herdsman. He can readily drive herds through the forest paths among the hills, and as readily find any animals that stray from the herd. He is a keen hunter, and therefore useful in protecting the herd from attacks by wild animals. Such men can be hired for \$100 to \$150 per year. They are docile, faithful, and even affectionate to those who deal justly with them. They are easily fed, for plantains, bananas, yams, and other food, upon which they usually live, grow in every part of the country.

CATTLE TAXATION AND EXPORT DUTIES.

Ownership of stock is indicated by branding, as "out West" in the United States. The various brands are recorded in the districts where the herds are kept, and when there is a sale the brand is duly described in the bill of sale. A tax of \$2 per head is levied by the Government on each sale of cattle, and a municipal tax of 50 cents per head upon slaughtering. A duty of \$2 per head is imposed upon bulls and steers exported and of \$16 upon each cow exported. As cows are worth only about \$18 when exported, it will be seen that the export duty of \$16 practically prohibits the exportation of cows from this Republic. Slaughtering heifers or cows capable of breeding is prohibited by law. So it is evident that the Government of Honduras by these wise regulations is fostering the interests of cattle-growers as well as of the country generally, for the restrictions upon the exportation and the slaughter of cows are causing a rapid increase of the cattle in the country.

CATTLE INCREASE IN HONDURAS.

From the most trustworthy information obtainable, the increase, the expense, and the income of herds of cattle in Honduras are fairly represented by the following table, furnished by Mr. E. W. Perry, an intel-

ligent expert in the cattle business, and it is based upon the supposition that the herd is, in the beginning, composed of 1,000 cows about to drop their first calves. The average annual increase that will reach maturity is assumed to be 80 per cent. of the number of bearing cows in the herd. Practical graziers here declare that an average yearly increase of more than 80 per cent. may be confidently expected, but as no carefully kept records showing that to be true are obtainable, it is deemed better to use the above as the basis of said table, which here follows:

Years.	Cows.	Heifers.	Bulls.	Value of bulls at 3 years.	Value of herds.	Expenses.	Net gain.
One year	1,000	400	400	\$4,000	\$12,000	\$1,000	\$3,000
Two years	1,000	400	400	4,000	16,000	1,400	2,600
Three years	1,400	560	560	5,600	26,800	1,800	2,800
Four years	1,800	720	720	8,640	35,760	2,300	3,260
Five years	2,360	944	944	11,328	46,280	3,080	4,248
Six years	3,080	1,232	1,232	18,480	66,080	4,024	14,456
Seven years	4,024	1,609	1,609	24,135	89,850	5,256	18,879
Eight years	5,256	2,102	2,102	42,040	122,560	6,865	33,175
Nine years	6,865	2,746	2,746	54,920	171,440	8,967	43,933
Ten years	8,967	3,586	3,586	68,670	270,620	11,713	77,957
Totals	8,967	14,299	14,299	262,813	270,620	40,465	210,318

It will be seen that at the end of ten years the herd will consist of—

1,000 scrub cows, which may be valued at \$10 each	\$10,000
1,360 grade cows, which may be valued at \$12 each	16,320
2,896 grade cows, which may be valued at \$15 each	43,440
3,711 grade cows, which may be valued at \$20 each	74,220
5,492 yearlings, which may be valued at \$10 each	54,920
7,172 high-grade calves, which may be valued at \$10 each	71,720
Total	270,620

The valuation of the above has been estimated as follows: 1,000 cows of the original stock will be worth \$10 each for beef at the end of their usefulness as breeders. The increase of the herd during the first three years will include 1,200 half-breed and 160 three-quarter blood heifers, valued at \$12 each. The next three years there will be 1,200 half, 960 three-quarter, 256 seven-eighth, and 480 heifers of higher grade, all valued at \$15 each. In the seventh and eighth years there would be produced heifers as follows: 800 half, 320 three-quarter breeds, and 2,591 heifers of higher breeding, all valued at \$20 each.

The average value of the bulls produced in the above herd has been estimated at prices which would make the general average \$18.38. The price of animals might, by the continued use of purely bred bulls, be made almost or quite equal to animals of pure blood, but in this estimate it has been assumed that they are worth no more than \$25 each at the end of the first ten years, or rather when the last calves shown in the table shall be ready for market. The expense of the management of such a herd for ten years will not exceed 10 per cent. of the value of the bulls.

EXPORTS OF HONDURAS CATTLE.

The markets for the cattle of Honduras are found in the towns scattered throughout the Republic and in the adjoining Republics. The available statistics, showing the amounts received for export duties on

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cattle during the fiscal year ended with July of each of the following years mentioned below, were as follows :

Exported from—	1883.		1884.		1885.	
	Value.	Numbers.	Value.	Numbers.	Value.	Numbers.
Truxillo	\$30,301	15,150	\$44,886	22,443	\$5,929	2,960
Puerto Cortes	3,111	1,555	5,477	2,738	4,057	2,028
Amapala			2,660	1,030	4,892	2,446
Frontiers	59,433	29,716	17,552	8,776	26,607	13,303
Totals	92,845	49,421	60,975	34,967	37,476	18,737

Expenses.	Net gain.
\$1,000	\$3,000
1,400	2,600
1,500	2,500
2,300	6,200
3,080	8,248
4,024	14,456
5,256	18,579
6,865	35,175
8,967	45,933
11,713	77,957
46,465	216,348

will consist of—

.....	\$10,000
.....	16,320
.....	43,440
.....	74,220
.....	54,920
.....	71,720
.....	270,620

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There appears to have been a material shrinkage, year by year, in the amount of duties from exports of cattle, while at the same time the sum received at Truxillo, in the year ended with July, 1884, showed a marked increase. That increase was due to the opening of a trade in beeves between the port named and the West India Islands. That trade was favored by concessions from the Honduras Government, but even the advantage thus afforded failed to make the traffic profitable, and it was abandoned after a trial of some two years. The losses which resulted were heavy. The steamer Marco Aurelio, fitted for and used in the exportation of cattle from Honduras to Cuba, has for some time been offered for sale in New Orleans. This seems to indicate that her owners see no hope of a profitable revival of that branch of the cattle business. During the year 1884-'85 exports of cattle from Truxillo fell from 22,443 to 2,960. The last-mentioned number were probably sent to British Honduras, which gets from this Republic all the beef required for consumption in Belize.

Puerto Cortes exports nearly as many cattle as Truxillo. In the year ended with July, 1883, exports from Puerto Cortes numbered 1,555. During the following year the number increased to 2,738, or 76 per cent. In the year ended July 30, 1885, the exports fell off 710 animals, or 35 per cent. At Amapala, on the Pacific coast, 1,030 were exported in 1883-'84, and only 446 were shipped thence in 1884-'85.

The most noteworthy changes in the value of exports of cattle from this Republic are those shown by reports from the frontiers. When the Cuban trade sprang up it drew to Truxillo many cattle, which would, but for the new demand, have gone across the border to Guatemala, to Salvador, and to other adjoining Republics. The result was that receipts of export duties from the frontiers decreased some 70½ per cent. in the year 1883-'84, when the Cuban trade was in its most active stage. When the Cuban trade died exports by way of the frontiers increased 45 per cent. These facts seem to indicate that the opening of the trade with the Antilles diverted 45 per cent. of the surplus beeves from their usual markets in adjoining countries, and also drew from the Honduras domestic markets 25 per cent. of the beeves exported from Truxillo.

It is a fact worthy of note that although exports from the ports of the north coast increased in 1883-'84, there was in the total exports of that year a decrease of 11,524 cattle. Another curious fact is that, while exports by way of the north coast shrank from 25,181 cattle in 1883-'84 to 4,988 in 1884-'85, the total exports through other customs districts appear to have increased only 3,943 during that year.

These facts seem to warrant the inference that the supply of cattle is increasing rapidly in Honduras. This inference seems to be the more

likely, since it is probable that few if any female cattle were represented by the figures above quoted, because the export duties imposed upon cows were so heavy as to be prohibitory.

CATTLE CENSUS OF HONDURAS.

Assuming that the average annual supply of beeves in this country equals the number exported in 1882-'83, the supply would now be 27,684 greater than it was at the close of the month of July, 1883.

No official data later than the statistics for the year 1881-'82 are at hand showing the number of cattle in Honduras. At the time named there were reported 168,750 cows having young calves by them; 191,283 cows not suckling their young; 44,629 heifers, and 139,018 calves. These figures show that there were at that time 404,662 cows nearly or quite all capable of bearing young. If it be estimated that the average annual increase of females that have since 1882 come into bearing has equaled 40 per cent. of the supply of cows on hand at that date, there would now be nearly or quite 600,000 cows in bearing in this Republic. The highest official authorities in Honduras confidently assert that the above statistics represent at most no more than one-half of the cattle production of the Republic. It is but reasonable to conclude that if their opinion is well founded the country can now produce 400,000 beeves per year. On the other hand, if the statistics are nearly correct, then it is safe to assume that the average yearly production of bulls is more than 240,000.

MATURITY OF HONDURAS CATTLE.

Cattle here reach maturity at a late age. As a rule heifers are three years old before they produce their first calves; and bulls go until this age before castration, and are four, five, or six years old before they are slaughtered for beef. It might be reasonably supposed that beef from animals so treated is tough and stringy and of poor flavor.

BUTCHERING AND COOKING.

It is not likely that there is in all Honduras a butcher's block, or saw, or cleaver. A slice of steak or roast of neat shape is rarely, if ever, seen. The meat is haggled from the bones in shapeless pieces, and these, within three or four hours after the death of the bullock, are cooking in the earthen pottery, which here supplies the place of iron cooking utensils.

THE OUTLOOK FOR CATTLE-RAISING IN HONDURAS.

That Honduras offers many and great natural advantages to cattle-men cannot be doubted. If a home market to absorb the surplus beeves should be created, as by the establishment on the coast of a canning factory, this country would equal, if in truth it would not far surpass, any part of the United States as a cattle-growing region. Here no epizooty or other disease of a serious nature has ever existed; no storms, or snows, or hard winters; but spring, alternating with summer, and both ever redolent of healthful perfumery and balmy breezes, which play over broad prairies, covered by succulent grasses, and watered by crystal streams and refreshing showers.

D. W. HERRING,
Consul.

UNITED STATES CONSULATE,
Tegucigalpa, March 24, 1886.

THE ARGENTINE REPUBLIC.

THE CATTLE INDUSTRY OF THE ARGENTINE REPUBLIC.

REPORT BY CONSUL BAKER, OF BUENOS AYRES.

I have to acknowledge the receipt of the circular of the Department of State, dated the 18th of July last, asking information relative to the breeding-cattle of the different stock-growing countries of the world, and annexing a series of forms to be filled with details in regard to breeds, size, weight, average product of milk, butter, cheese, meat, &c., together with topography and conditions of climate, quality of soil, kinds of cultivated grasses, and methods of handling, &c., in the localities where they are raised, these reports being requested with a view to the importation of new breeds into the United States for the purpose of improving our own stock.

MILK, BUTTER, AND CHEESE IN THE ARGENTINE REPUBLIC.

In reply I have to state that the information sought has no application whatever to the Argentine Republic, since there are no breeds here which it would be worth while to import into the United States. The raising of cattle is, next to wool-growing, the most important industry in this country, but the stock is exclusively *creole*, and, so far as the topics suggested in the circular are concerned, there is nothing whatever to communicate which would be of any use to the stock-breeders at home.

It may seem paradoxical, yet it is true that while the Argentine Republic contains about 12,000,000 of horned cattle, it produces neither milk, butter, nor cheese, while the beef itself is, generally speaking, so inferior, at least in this part of the country, as to be the subject of universal execration. Such a thing as a dairy farm is unknown; such a thing as butter-making, in the true sense of the word, is a myth; such a thing as a cheese-factory, if we except a cheap curd produced in Goya, has never been attempted. In this immediate neighborhood you may or you may not find milk enough for your coffee, but not elsewhere. Nobody, with rare exceptions, keeps a milch cow. Butter, if it is used at all, has until very recently been brought from Italy. Of late years, an unsalted butter, the work of Spanish Basques settled near Buenos Ayres, has been finding its way to market, but it is nothing more than coagulated cream, while the cheese comes mostly from England or Germany. Not long ago I visited an estancia stocked with 15,000 cattle, and we did not have a mouthful of butter for our bread, while our coffee was seasoned with condensed milk from Illinois.

ARGENTINE CATTLE RAISED EXCLUSIVELY FOR SLAUGHTER.

Cattle have never been raised in the Argentine Republic, either for the milk, butter, or cheese they might produce, but exclusively for slaughter; and their only product, for export entirely, is hides, horns, bones, sinews, and a kind of jerked beef (*charqui*) which finds a market in Brazil and Cuba for the slaves. The science of husbandry is without any development in the Argentine Republic. During all the years which have elapsed since its conquest by the Spaniards, no attention what-

ever has ever been paid to the improvement of the breed, and the horned cattle which to-day feed upon the natural pasturage of the pampas are the descendants of those with which the country was originally stocked.

INTRODUCTION OF HORNED CATTLE INTO THE RIVER PLATE.

This occurred about the year 1550. According to the American archives in Seville,* Don Pedro de Mendoza was the first who introduced horned cattle into the regions of the Plate. He brought for the colony which he founded sixteen cows, two bulls, thirty-two horses and mares, twenty goats, forty sheep, and eighteen dogs. It is further related, according to details given by Ruy Diaz de Guzman, that Ayola and Martinez de Irala, the chiefs of the expedition, took several of these animals with them to the interior, and that others were lost in the wastes which are found in the delta of the Parana River near the present village of San Fernando. A little later, 1553, two brothers named Goës, who came in company with Alvar Nuñez Cabeza de Vaca, from Brazil, brought their cattle, consisting of eight cows and a bull, with them to Asuncion, Paraguay, where the new acquisition was received with great enthusiasm.

From these two sources have descended the horned cattle which in innumerable herds now form the stock of the Argentine plains. From that time to the present day the increase has been spontaneous, the mild climate and succulent grasses of the pampas being all the conditions required for their rapid multiplication and diffusion. But thus left to themselves, they have been permitted to degenerate by continuous breeding-in, without any effort ever having been made to improve their original good qualities, until now, after a lapse of three hundred years, they are without any of the characteristics which would make them a desirable acquisition to cattle-breeders, unless perhaps it be the quality of their hides, which the rough life they have encountered have made stronger and tougher than most hides which find their way to the markets of the world. In other respects, however, they have little to recommend them in countries where stock-breeding has had any development.

WILD CATTLE OF THE PAMPAS.

The cattle of this country came originally from the south of Spain, and are said to exhibit still the characteristics of the breed of that locality, the range between the 22° and 42° of south latitude, in this country not having exercised much influence upon them. Indeed they are as robust on the plains of Oran, the borders of the Vermijo, and in the subtropical forests of Misiones as they are on the pampas of Buenos Ayres. Their size, however, depends very considerably on their pasturage. It is smaller on the dry and arid plains of Catamarca and Santiago del Estero, and larger on the luxuriant grasses of Buenos Ayres and Banda Oriental. It was not until the beginning of the seventeenth century that their diffusion over the pampas of Buenos Ayres began to attract attention. The Indians, who inhabited those plains, and who up to the time of the conquest had no domestic animal, soon learned the value of the horse, and used it fearlessly in their chase of the deer, the ostrich, and the guanacho, but they paid little attention to the new cattle, which were increasing so rapidly around them. Indeed it appears that while they used the flesh of horses, whether domestic or wild, for their ordinary food, they had no relish for beef, and it is only since a comparatively recent period that the Pénhuenches and other

* Dominguez's History of the Argentine Republic.

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tribes living on the eastern slopes of the Andes commenced to use horned cattle for food,* though they still prefer horse meat. In those early days nearly all the cattle on the pampas were wild (*alzados*), and most of them without owners. The reverse is now the case, and they are comparatively tame, that is to say, they are accustomed to the presence of men and allow themselves to be guided by them.† Even at the epoch referred to, over a million hides were annually exported from the Plate. The cattle-farms, or *estancias*, however, only contained a small proportion of tame animals, the rest being wild were pursued on horseback for their hides.

The manner of killing them was as follows: The mounted *gauchos*, carrying in their hands a lance, with a sharp horizontal knife in the end, gave chase to the animals, and approaching them on the full gallop, cut their hamstrings as they ran, bringing them down with an address and dexterity which were astonishing. When they had thus secured a sufficient number, they returned and gave the *coup de grace* to the prostrate animals by severing, with a perpendicular thrust, the spinal cord just back of the horns. When the slaughter was completed, they removed the hides, which they stretched on the ground with pins, and abandoned the carcasses to the dogs and birds of prey. This system of slaughtering is still sometimes practiced on animals whose poor condition make them of no value except for their hides. In such cases they are driven to the neighborhood of the slaughter-house; and, after being skinned, their bodies are used for fuel for the boilers, while their bones are pulverized for manure.

NUMBER OF HORNED CATTLE IN THE REPUBLIC.

The business of horned cattle has formed for nearly three centuries the sole occupation of Spanish settlers and their descendants, and it is still almost exclusively in the hands of the natives, as sheep-farming is in that of foreigners. It is the general impression that the number of horned cattle now in the Argentine Republic is not so large as in former years, owing to the immense slaughter, principally for their hides, which has heretofore been carried on. There are, however, no statistics based on actual count to prove this fact. I give below the number supposed to have been in the Republic in 1869, compared with the number estimated for each province in 1881:

Province of—	Number in 1869.‡	Number in 1881.§
Buenos Ayres.....	5, 116, 020	4, 754, 810
Entre Ríos.....	2, 500, 000	2, 216, 562
Santiago del Estero.....	1, 200, 000	200, 000
Santa Fé.....	1, 100, 000	900, 000
Corrientes.....	1, 768, 708	1, 460, 000
Cordoba.....	652, 470	1, 043, 000
Tucuman.....	305, 228	304, 700
San Luis.....	248, 344	130, 602
Catamarca.....	200, 543	80, 000
Sau Juan.....	28, 561	65, 493
La Rioja.....	72, 043	100, 000
Mendoza.....	64, 878	100, 108
Jujuy.....	93, 276	50, 000
Salta.....	143, 010	200, 000
Total.....	18, 093, 090	11, 554, 275

* Description géographique et statistique de la Confédération Argentine, par V. Martin de Moussy, vol. ii, p. 66.

† Captain Musters, in his book "At Home with the Patagonians," speaks of the immense numbers of wild cattle which are found without owners in the forests on the headwaters and tributaries of the Rio Negro, and the western slopes of the Cordilleras of the Patagonian Andes.

‡ Census of the Argentine Republic, 1869.

§ Ibid., 1881.

ARGENTINE EXPORTS OF CATTLE PRODUCTS.

The importance of the cattle industry, in a commercial point of view, will appear from the custom-house statistics, since the entire product, after providing for a meager home consumption, finds a market abroad. According to those returns, the exports of the products of horned cattle stand for about one-third, while the exports of the sheep products stand for about one-half of the entire shipments abroad. To be more exact, it appears that of the total exports last year, 56.5 per cent. were wool and sheep-skins, 32.3 per cent. were the products of horned cattle, while only 11.2 per cent. were agricultural, mineral, forest, and manufactured products. The exports of the total pastoral industry, compared with all other exports, for the last seven years are shown in the following table, compiled from official sources: *

Exports from the Argentine Republic from 1876 to 1882.

Articles.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
Pastoral products.....	\$40,092,711	\$38,208,064	\$31,891,836	\$41,351,831	\$50,567,372	\$57,770,303	\$49,142,494
Agricultural products.....	428,963	602,642	485,802	2,156,187	784,423	1,495,935	4,241,669
Mineral products.....	200,823	217,544	154,872	363,025	2,407,324	402,763	568,591
Timber products.....	41,784	58,670	35,216	78,154	113,364	286,180	226,414
Manufactured products.....	5,726,388	4,212,639	3,722,538	3,754,473	2,386,414	1,592,313	3,844,837
Other exports.....	48,337	27,901	22,894	61,617	238,526	521,610	416,900
Total.....	40,539,206	43,327,409	36,313,158	47,795,287	56,497,423	52,069,104	58,440,965

As a matter of especial interest in connection with the cattle industry, I give below the shipments separately of each article produced during the last seven years, as taken from the custom-house returns:

Exports of cattle products from 1876 to 1882.

Articles.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
Cow hides..... No.	2,324,866	2,488,532	2,238,602	2,336,529	2,791,299	2,192,370	2,945,427
Dried and jerked beef..... kilos.	29,666,210	38,732,623	33,600,293	32,336,252	36,116,479	22,412,631	26,968,033
Bones and bone-ash..... do.	33,234,837	304,685	30,231,010	36,436,267	27,692,477	34,763,049	28,212,588
Horns..... do.	3,056,000	3,862,000	2,998,454	2,706,780	2,966,416	2,963,041	1,410,983
Hide cuttings..... do.	1,631,466	1,122,152	880,204	998,369	1,242,784	781,709	879,183
Animal oils..... do.	216,149	891,666	815,592	422,625	306,381	199,278	542,602
Animals on the hoof..... No.	109,726	169,445	86,308	422,573	52,258	84,638	53,965
Salted beef..... kilos.	4,149	143,749	110,038	7,594	2,417	18,593	1,082,497
Animal-black..... do.	.....	1,156,320	1,204,540	3,160,890	3,591,477	1,082,497	1,836,770
Artificial guano..... do.	2,627	.....	55,560	852,259	.....	124,450	1,111,945
Dried blood..... do.	28,793	.....	42,946	187,472	1,030	453,131	92,547

I would state that there is an export duty on all the above articles of 7 per cent. on the value, except salted beef, animal-black, artificial guano, and dried blood, which are free of duty; and that all horned cattle exported from the country pay a duty of 75 cents per head.

Of the above exports it appears from the custom-house returns that about one-third of the hides go to the United States, the rest to England, France, Spain, Belgium, &c.; that the jerked and dried beef goes principally to Brazil, Cuba, and Spain; that two-thirds of the bones and

* *Estadísticas oficiales de la Republica Argentina, 1876-1882.*

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1881.	1882.
\$57,770,303	\$49,142,494
1,495,935	4,241,689
402,763	568,591
286,180	228,414
1,592,313	3,844,837
521,610	416,900
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	1881.	1882.
209	2,192,370	2,945,427
79	22,412,631	28,966,613
77	34,763,049	28,212,598
16	2,003,041	1,410,983
84	781,709	879,183
81	190,278	542,602
58	84,638	53,995
17	18,593	
77	1,062,497	1,936,770
1	124,450	1,111,945
39	453,131	92,547

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bone-ash go to England, the rest principally to the United States; that the horns go to England, France, Italy, and Belgium; that the hide-cuttings go to Belgium, Germany, United States, and England; that the animal oils go to France; that the live animals go to Chili and Bolivia; that the animal-black goes to France; that the artificial guano goes to the United States and England, and that the dried blood goes to the United States.

The gradual decrease in the above shipments would seem to corroborate the general impression that there has been a decrease in the number of horned cattle in the country. According to the official estimates already mentioned, it appears that there are about 2,500,000 less in the Argentine Republic to-day than there were fourteen years ago. This count does not include the number in the territories of Patagonia, Gran Chaco, Pampa, and Misiones, which probably amounts to 300,000 more.

It will further be seen that over one-half are on the pampas of Buenos Ayres, Santa Fé, and Cordova, the rest being scattered in smaller numbers over the uplands of the interior, and the mesopotamian provinces of Entre Rios and Corrientes.

HOW CATTLE ARE MANAGED IN THE ARGENTINE REPUBLIC.

It may be said that the cattle of the country are now all tame, in the sense that they all bear the brand or mark of their owners, are accustomed to the range of the *estancia* to which they belong, and allow themselves to be handled by those whose duty it is to watch after them and make up the *rodeos*, that is, bring them to the place where they sleep at night. When the young bulls have been castrated they go by the name of *novillos*; and the number of bulls left entire is about one to every fifty cows.* It is very important that the men should constantly watch after the animals, for if left to themselves they soon become intractable and difficult to manage. Where the attendance is negligent, they are readily frightened at the sight of a horseman, and disastrous stampedes sometimes are the consequence. Where these occur, it is only with infinite pains that they can be restored to former docility.

When the number of bulls are allowed to become too numerous, furious and fatal combats not unfrequently ensue, the cows taking part in the deadly encounters, and thus the annual calving is apt to be reduced. A few years ago, during the civil wars in Uruguay and pending the long siege of Montevideo, a great portion of the cattle on the abandoned *estancias* having nobody to take care of them, returned to a wild state (*alzado*), and upon the restoration of peace, it was found absolutely necessary to kill all the old bulls and castrate the young ones in order to tame the cows and make them easier to manage; and even then it took an enormous amount of time and the ruin of hundreds of horses on each establishment, before the herds could be reduced to a tractable condition. And the same thing occurs wherever, for any cause, the cattle of an *estancia* are neglected. In a very few months they return to a wild state, thus entailing great losses on the owners.

With proper attendance and careful management, however, it is astonishing how easily the cattle of the Argentine Republic are handled. The bulls exhibit none of the ferocity which is characteristic of those of other countries, and even to supply the bull fights which are still allowed to be exhibited in Montevideo, it is necessary to import the bulls from Spain, those of the country not being sufficiently savage and fero-

* V. Martin de Moussy, vol. ii, p. 110.

cious for the purpose. The cattle here seem to have such an instinctive respect for a horseman that they run or yield at once, and seldom show any obstinacy or resistance to his authority. A person on horseback can quietly pass into the midst of the largest herds without fear, as the animals will always at once open their ranks before him; and they are so accustomed to see the people of the country dressed in clothes (*ponchos*) of bright hues, that the most glaring red colors do not enrage them.

One thing, which the *estancieros* have to guard against, where their herds are newly formed of cattle collected at different places, is the tendency of the animals to return to their former ranges; and frequently in cases of panic they scatter in all directions, and it is difficult to get them together again. This desire of cattle to return to the places where they were raised (*querencios*) is much stronger should the old pasturage be better or the country more saline, the latter quality of the soil greatly contributing to the increase of the herds of the river Plate. In no other way can be explained the remarkable fact that in places where there is a lack of salt, notwithstanding the beautiful appearance of the pasturage, such as for instance is found in the southeastern parts of Paraguay and in the provinces of Saint Catherine's and Saint Paulo, Brazil, those parts of South America are not so suitable for the raising of cattle as the pampas of Buenos Ayres, or even the mesopotamian provinces of Entre Rios and Corrientes. In these regions, in spite of the dryness and even aridity of the soil in some places, and of a pasturage which is meager in appearance, the reproduction is so considerable that it is estimated that a herd of cattle will double in three years. It is to this quality of the soil that the beauty of the cattle on the Vermijo River is attributed, where, notwithstanding the exceedingly warm summers and the great annoyance from flies and mosquitos, they are fully as large as those in the province of Buenos Ayres, and are seldom attacked with epizooty.

WORKING CATTLE AND MILCH COWS.

Owing to their natural docility, the taming of work cattle is accomplished without difficulty. They allow themselves at once to be put to the plow or the wagon, though the manner of yoking them by the head, which prevents them from using their horns, may greatly assist in their domestication.* If they are not so strong or robust as those we have at home, it is only because their food is less substantial; for, even while performing the longest journeys, they have no other nourishment than the grass they can pick up, when they stop to rest, on the pampas; and this is generally very scant along the highways or near the villages. Properly fed these animals, which are large and muscular, would be capable of much more unremitting work.

For the same reason the cows give but little milk, and then only when the calf is present; and it generally dries after three or four months. On this account milk is almost unknown in the interior of the country, in spite of the immense number of cows, and no butter is to be obtained except in the immediate vicinity of the river towns, where the cows in a few cases are stabled and fed.

* The ox-yoke of the Argentine Republic is a simple bar of hard wood, slightly hollowed out on the lower side, laid across the heads of the animals and lashed to the horns by hide thongs. The Argentines insist that an ox can pull greater loads by his horns than by his shoulders, but I doubt it entirely.

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WINTERING CATTLE.

Living entirely in the open air, and having no protection whatever, no matter how severe the weather may be, and depending solely upon the natural grasses of the country for their nourishment, the cattle become very lean during the winter months especially if there has been a drought during the summer, thus preventing the growth of vegetation. Thus reduced in flesh, they become very susceptible to the cold; and under such circumstances, when driving rain or snowstorms occur, with the wind from the southwest, hundreds of thousands have been known to perish in a single night.* In the spring they at once begin to improve, though the young grass is so watery at first as to cause violent purging; and many cattle are sometimes lost from this cause, especially if they are in poor condition. The skins of cattle that perish from these or other like causes are always removed, and are sold in the market under the name of *epidemia* hides, though of course the word is not intended to convey the meaning that the animals died from an epidemic disease, which seems to be the impression abroad. So soon as the succulent grasses of the pampas begin to mature, that is, during the months of November and December, the cattle begin to improve.

FROM THE ESTANCIOS TO THE SLAUGHTER-HOUSES.

The moment they have acquired sufficient strength and condition, and will stand the long drives, the *novillos* are separated from the rest of the herd and sent to the slaughtering establishments (*saladeros*) or the city market (*mataderos*), an operation which sometimes requires a large number of men (*peones*) and much care; for pastured cattle are apt to be quick in their movements, and a very little thing will cause them to stampede in disorder and regain their old range. On the other hand, unless occasional rests and breaks in the journey are permitted, since the distance to be traveled is not unfrequently hundreds of leagues, the animals become tired and the meat loses its natural taste (*bon goût*). I may add, however, that in the markets of Buenos Ayres "tired" meat is the rule instead of the exception. It is on account of these long drives, without water or food at proper intervals, that the beef sold in the cities does not in any respect compare with that which you can obtain on the *estancias* themselves, where ordinarily it is of most excellent flavor.

REQUISITES OF AN ESTANCIA.

A cattle *estancia*,† in order to be considered first class, requires three conditions, good quality of grasses, an abundance of water, and range sufficient to hold and feed a large herd—conditions which, from the beginning, the Spanish colonists seem to have well understood, in the selections of the lands upon which are to-day be found the great cattle farms of the country. The development, however, of the wool industry during late years has had a tendency to drive the cattle farmers farther

* Mr. Darwin in his "Naturalist's Voyage Around the World," page 133, says: "While traveling through the Argentine Republic, I received vivid descriptions of a late great drought, during which time so little rain fell that the vegetation, even to the thistles, failed, the brooks were dried up, and the whole country assumed the appearance of a dusty highway; very great numbers of birds, wild animals, cattle, and horses, perished for the want of food and water. The lowest estimate of the loss of cattle in the province of Buenos Ayres alone was taken at one million head."

† Mulhall's Hand-Book of the River Plate.

out from this city, the inner "camps," which furnish soft grasses being in demand for the grazing of sheep. It is still easy to obtain most excellent *estancia* lands in the outside *partidos* (counties), while the Government sells its lands on the frontiers at prices which are considered reasonable, but the demand for places in those localities is increasing every year, and it now requires no little capital to buy and stock a cattle farm anywhere near to a market.

Estancias for horned cattle usually vary from 1 to 10 square leagues in extent, while those on the frontiers are even much larger. The *estanciero* takes care to select a piece of land, if possible, bordered by a river or having water courses (*arroyos*) running through it or permanent lakes (*lagunas*) of fresh water, and as free as possible from hemlock and burr. The grass of a stock farm is what is called *pasto fuerte* or coarse grass, which stands the dry seasons better than the meadow grass or trefoil on which sheep are pastured, and which does not begin to appear until the coarse grass has been entirely eaten down.* In building his house the owner is guided by his taste or his means. In former times, and it is still the case in some parts of the country, the *estanciero* lived in a mud hut without a window, nowadays very luxurious residences can be found, even on the frontiers, furnished with every modern convenience.

The corrals, generally near the house, are large folds for inclosing the cattle when necessary, and are most important appendages to an *estancia*. They are made of upright posts of hard wood, 7 feet high, fastened together by means of cross-bars and hide thongs. They are generally oval or circular in form and strongly made, so as to securely hold a large number of cattle, the gate consisting of two or three transverse bars. The grounds (*monte*) immediately surrounding the house generally comprise from 10 to 50 acres, wired in, with a ditch on the outer side, and consist for the most part of timber and fruit trees—generally peach, for the reason that they are such rapid growers, arriving at maturity in three years and serving the double purpose of fruit and fuel, besides making fences.† These patches of timber are landmarks on these unending plains, visible for many miles, and at a distance look like green hills, whence the name which is given to them. In peach *montes* one-third of the plantation is cut down at intervals, and is allowed to grow up afresh from the stump; and in this manner the supply of fruit and timber is constant and abundant. Such a thing, however, as a vegetable garden is almost unknown. The staff of an *estancia* usually consists of a superintendent called *major-domo*, who represents the owner; a *capitaz* to oversee the peons or laborers, and from five to twenty of these peons, according to the size of the *estancia*, who earn from \$10 to \$25 per month.

Where an *estancia* is very large in extent and the cattle are numerous, there are established, at corresponding distances from each other

* In reference to this change from coarse to soft grasses produced by the pasturage of horned cattle, Mr. Darwin (Naturalist's Voyage Around the World, p. 118) says of the Argentine pampas: "I was very much struck with the marked change in the aspect of the country after having crossed the Solado River. From a coarse herbage we passed on to a carpet of green verdure. I at first attributed this to some change in the nature of the soil, but the inhabitants assured me that the whole was to be attributed to the manuring and grazing of the cattle. Exactly the same fact has been observed in the prairies of North America, where coarse grass, between 5 and 6 feet high, when grazed by cattle, changes into common pasture land. I am not botanist enough to say whether the change here is owing to the introduction of new species, to the altered growth of the same, or to a difference in their proportional numbers."

See Mr. Atwater's account of the prairies, in Silliman's Journal, vol. i, p. 117.

† On many *estancias* poplar, eucalyptus, and willow plantations are now very common.

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and from the *estancia* house, a number of smaller houses, called *puestos*, with their appropriate surroundings of corral, *monte*, &c., where a peon with his family resides and has charge of a portion of the cattle. By means of these sub-establishments the animals are more evenly distributed over the grounds for grazing purposes and do not crowd each other, but they are always in daily communication with the *major-domo*.

NUMBER OF ANIMALS AN ESTANCIA WILL MAINTAIN.

The number of animals which can be supported on a square league of land varies a great deal, and depends upon the quality and quantity of the grass. Where the pasturage is heavy and nourishing, that amount of land will very readily sustain 3,000 horned cattle, and even more, together with all the working cattle, horses, mares, and sheep intended for the use of the establishment. On a "bad camp,"* however, where the grazing is limited, owing to *saliras*, *saladas*, and other causes, whereby the vegetation is not luxuriant, the number of animals must be correspondingly reduced; and even then, in times of drought, it frequently happens that the cattle die of starvation, unless they are promptly removed to a better pasture. It is generally assumed in the province of Buenos Ayres that 9,000 square yards are required to sustain a bullock the year round, but this only refers to those *estancias* which have an abundance of both grass and water. Otherwise the estimate at the present day is too large.

HOW THE STOCK IS HERDED.

The stock of an *estancia* of course depends upon its extent, but often numbers 10,000 and even 15,000 head, divided into herds of 2,000 or 3,000 each, each herd being gathered up every night in its own *rodeo*, an open space where each animal regularly chooses its own place to lie down. Here they remain until morning, when they again set off to graze. In seasons of drought cattle sometimes stray great distances in search of water, but unless they calve on their new pastures they will return to their former range. Sometimes where there is scarcity of water, the cattle are watered by a *balde sin fondo*, a hide bucket, which is worked by a man on horseback in a very primitive fashion, the bucket being pulled up over a wheel and thus emptied of its contents into a long trough. In this manner one person can water 2,000 cattle per day.

To one who sees for the first time a cattle *estancia*, the facilities with which large herds are managed is a source of continual wonder. The animals need no immediate personal supervision whatever, saving at most a daily gallop by a peon around the boundaries of the land; and in order to bring them to their *rodeos* all that is necessary is for a peon to set out on horseback, cracking his whip and shouting at the pitch of his voice, and the cattle at once stop their day's feeding and troop off to their appointed place—and all this in an open plain where fences are almost unknown.† The *gauchos* evidently understand the natures of

* "Camp," used in ordinary conversation by everybody in the Argentine Republic, is a contraction of the Spanish word *campo* and means "the country."

† "The operation of counting the cattle on an *estancia* would be thought difficult, where there are ten or fifteen thousand head together, but it is managed on the principle that the cattle invariably divide themselves into little troops of from forty to one hundred. Each troop is recognized by a few peculiarly marked cattle and its number is known; so that one being lost out of ten thousand, it is perceived by its absence from the *tropellas*. During a stormy night the cattle all mingle together, but the next morning the *tropellas* separate as before, so that each animal must know its fellow out of ten thousand others." (Darwin, page 145.)

horned cattle, for the manner of subjecting them to the dominion of man is so easy and so perfect that it has never been improved on by the numerous foreigners who have turned their attention to cattle-breeding in this country.

CATTLE VERSUS SHEEP.

The rearing of cattle is much less laborious in the Argentine Republic than that of sheep; but the latter pursuit is considered as the most lucrative, for the reason that five or six sheep can be maintained on a pasturage that would feed only one bullock. Notwithstanding this advantage and the fact that sheep reproduce themselves in a much shorter time, the natives prefer cattle farming, either from the fact that a much smaller outlay of money is needed, or because no care or study is necessary to render the pursuit successful. The two industries, however, do not at all conflict, for the reason that, while sheep are raised only in parts of the country where the soft grasses abound, the cattle farms are farther out and consist of the harder grasses. In many places, however, the two industries, as also that of breeding horses for slaughter, are more or less combined. The management of an *estancia* is a very simple routine of daily care, involving no hard work whatever. Almost everything is done on horseback, every man, woman, and child belonging to the establishment having their own horse, which is generally kept saddled all day long at the *palenque* (a row of posts with a horizontal bar) ready for service at a moment's notice. No one thinks of walking even a few hundred yards; and it is not uncommon to see a man mount a horse to go to the opposite side of the road.

MARKING THE YOUNG ANIMALS.

The great business of an *estancia* is the marking and castration of the animals. This occurs generally in the months of May and June, the season when the flies have disappeared and the weather has become cool. The young cattle are altered at two years of age, and the losses resulting from it are about 4 per cent. The marking is done at the same time, and it is a season of great amusement in camp-life. All the peons of the establishment and many others from the neighborhood assemble in full force. The cattle are driven into the *corrals*, and each animal in turn is caught over the horns with a lasso by a man on horseback; another lasso (or the "*bolos*") is quickly passed around his hind legs, which at once throws him to the ground, and the operation is completed in a moment. Then a red hot iron bearing the owner's monogram or mark, the purport of which is duly registered in the proper office, is firmly planted upon the poor brute's flank, while a blue smoke curls upward from the palpitating flesh, thus leaving a mark which is indelible. This is the only way that the owners can distinguish their cattle, there being no bounds or fences to the various *estancias*, and in case of sale they must also have the brand of the purchaser. These brandings are often done so bunglingly, or made so deeply that they greatly injure the hide for commercial purposes. The day's work, called *yerra*, always winds up with a feast of meat cooked in the hide (*carne con cuero*), than which nothing can be more savory or delicious. No coals or wood, but only bones are employed in cooking it, each man with his own sheath knife cutting off the piece that suits him best.

HORSEMANSHIP AND DETERTY OF THE GAUCHO CATTLE HERDEES.

The *peons* or *gauchos* generally take advantage of these merry makings to show off their prowess or their accomplishments. The horse-

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manship of the *gaucho* is wonderful. On his saddle (*recado*), chiefly made of untanned horse-hide and sheep-skin, he sits with the consciousness that he is the horse's master. Indeed it is seldom that he puts his foot in a stirrup—for the purpose of riding, never. And his dexterity in throwing the lasso is equally astonishing. His aim is almost unerring. Singling out a horse or a cow in the middle of a herd, he will bring him down with unfailing precision. He will pursue an animal in full chase across the plains, and when sufficiently near, he swings his lasso twice or thrice around his head and then lets it go. The moment it touches the runaway cow, the horse of the rider stops to receive the shock, and and down goes the cow headlong to the ground. Another way which he has of securing cattle is with the "bolos." These consist of two balls (iron or stone) covered with hide and fastened at the end of two short rawhide ropes, and thrown by means of another short thong, all three being secured together. They are twirled around the head like the lasso, and thrown at a distance of 60 or 70 yards with great precision; when, entangling the feet of the pursued animal, it is brought to the ground with a violent shock. He is also exceedingly clever in plaiting bridles of untanned hide thongs, and his great ambition is to caparison his horse with elaborate silver trappings, worth sometimes several hundred dollars; and when on horseback, dressed in his fantastic costume of striped loose fitting *chiripás* and his scarlet vacuña poncho, falling gracefully over his shoulders down to his hips, he presents an appearance which would attract attention anywhere. With the termination of the feast, they indulge in indiscriminate horse racing, and not unfrequently, for betting is a besetting sin with the whole race, by night-fall our gaucho has not only lost all his month's wages, but also his horse, and it may be even his poncho. With many of these singular people, however, this is scarcely looked upon as a misfortune; and they are not slow in recouping their losses by appropriating the first horse that attracts their fancy.*

THE GREAT SLAUGHTERING ESTABLISHMENTS.

When the cattle of an *estancia*, as I have already stated, are in sufficiently good condition from the spring pasturage to be able to undergo the journey, they are sent off in lots either to the slaughter-houses of the city (*mataderos*) or to what is known as the *saladero*. This is an establishment where cattle are slaughtered in large numbers, and all the product of the animal, meat, hide, grease, bones, horns, and other refuse, is collected and prepared for exportation. The erection of one of these establishments requires the outlay of no inconsiderable capital, and to be successful it must have an intelligent and economical organization. Without these, as the running expenses are always large, the business not infrequently fails to give such profits as are commensurate with

* Ex-President Sarmiento, in his book "*Civilización y Barbarie*," page 23, says: "The gaucho does not labor, he finds his food and raiment ready to his hand. If he is a proprietor his own flocks yield him both. If he possesses nothing himself, he finds them in the house of a patron or a relation. The necessary care of herds is reduced to excursions and pleasure parties; the branding, which is like the harvesting of farmers, is a festival, the arrival of which is received with transports of joy, being the occasion of the assembling of all the men for 20 leagues around, and the opportunity for displaying incredible skill with the lasso. The gaucho arrives at the spot on his best steed, riding at a slow and measured pace; he halts at a little distance and puts his leg over his horse's neck to enjoy the sight leisurely. If enthusiasm seizes him, he slowly dismounts, uncoils his lasso, and flings it at some bull passing like a flash of lightning forty paces from him; he catches him by one hoof, as he intended, and quietly coils his leather cord again."

the investment. On account of the amount of money required to start a *saladero*, the majority of them in the Argentine Republic are the property of joint-stock companies, many foreigners who know the economic uses to which all the parts of the animal can be applied, having large capital invested in these industries. As I have said, the time is passed, when cattle were killed solely for their hides, and their carcasses were left to rot on the pampas. Now all the appliances of European science and art are brought into requisition, and the entire animal is utilized.

One of the first conditions of a slaughtering establishment is that it should be near a navigable water-course, where the largest sea-going vessels can anchor and receive the product. Those in this country are located on the Uruguay, Parana, and La Plata Rivers. Several very extensive ones are at Ensenada, where is a fine bay, large enough to receive a fleet of vessels. Another condition is the possession of immense pasture grounds supplied with an abundance of water, so that the animals, tired out by their long drives on the road, may be allowed to rest and recuperate before going to their slaughter, for, independent of the worthlessness of tired meat, the hide is with difficulty removed from such animals, being easily cut during the operation, thus resulting in unsalable stock. It is also necessary to build deposits, respectively, for the salt, the meat, the hides, and the tallow; a long open shed for cutting and salting the meat, and offices for overseer, peons, &c., all of which are located conveniently to the slaughter-house proper.

In well-organized *saladeros* there are usually three corrals, the first and largest being built of very strong stakes or brick walls, opening widely to receive the herds driven slowly in by the peons. The second corral joins this and is only large enough to hold a number sufficient for the day's slaughter; and the third still smaller, and opening into the preceding, holds about twenty head at a time, and terminates in a narrow passage, through which there runs, on a level with the pavement, a platform car on iron rails. Around this small corral there is a high gallery on which one can walk, while a bridge passes over the railway passage, which is closed with folding doors. Through a pulley above these doors is placed a long lasso, the running knot of which is in the hands of the executioner, the other end attached to a yoke of oxen led by a boy. The executioner throws the lasso and catches the nearest animal around the horns, and calls to the boy to pull. Thus the animal is dragged instantly onto the platform, where instinctively he rests his head against the doors, when the man plunges his knife into its neck between the occipital and first vertebrae, thus severing the spinal cord. The animal falls dead, the door opens, and the car is drawn outside, the doors closing behind the carcass, which is at once deposited upon a paved way, and the car is returned to its place, and another animal lassoed.

The *maneuver* is done with extreme rapidity. The animals lying on the pavement are bled immediately, the blood running in a trough to a special tank and dried or made into artificial guano. The process of skinning the animal occupies but a moment. It is then cut into quarters, hung in an open shed on hooks, and then cut up into small strips, so that nothing remains but the bones. The meat thus cut up is piled under thick layers of salt several feet high. During these operations a part of the grease is put aside, while the bones of the limbs and carcass are removed to great wooden tubs, heated by pipes conveying the steam from the boilers, thus extracting all the grease which may remain. These vats are capable of holding upwards of thirty carcasses. The hides are salted and piled like the meat. The paunch and intestines are made into guano. The tongues, hoofs, tails, ears, horns, hide-cuttings, &c.,

are consigned to their respective receptacles. When the skeletons are removed from the boilers, all the grease has disappeared from them, only a few ligaments and remnants of flesh remaining. The larger bones, used for manufactures, are then separated, and the rest are used for fuel, the bone ashes being collected in barrels and sold abroad for manure.

In the space of about five minutes after it is slaughtered, the animal has entirely disappeared. As to the meat, when it has become well penetrated by the salt, after repeated turnings, at the end of about five days, it is placed in an inclosure on horizontal lattice work, and thus perfectly dried. After this it is piled in the open air upon a brick platform and covered with hides to protect it from birds of prey, or to await its sale. For transportation it is put up in barrels or bales securely pressed. The grease, after having been refined, is run into pipes and sold by weight. Some *saladeros*, to utilize the grease and tallow, have soap and candle factories annexed to the establishments.

Such is a general *résumé* of the usual operations of a *saladero* in good condition. Ordinarily they can slaughter and take care of four hundred animals per day, the work beginning at daylight. The men engaged in these establishments possess a wonderful dexterity in their several departments, and operate with a rapidity which is astonishing. The season for active work begins at the end of the spring months, either in November or December, when the animals are fat and can be slaughtered to the best pecuniary advantage, and it comes to a close when the frosts or the drought begins to cut down the pasturage. There are now in the Argentine Republic not less than twenty-one of these great slaughtering establishments, as follows: Eight in the province of Entre Ríos; one in the province of Santa Fé, and twelve in the province of Buenos Ayres, together representing a capital of over \$6,000,000. The annual number of animals slaughtered varies considerably, but generally reaches in this part of the River Plate to a million head, though in the last year or two this industry seems to be languishing.

CITY SLAUGHTER-HOUSES IN THE ARGENTINE REPUBLIC.

In the city slaughter-houses (*mataderos*) there is but little of the system which belongs to the *saladeros*, while there is displayed a great deal more cruelty to the animals. Those of Buenos Ayres are located to the southwest of the municipal limits and consist of a large number of corrals or pens surrounding an extensive inclosure in which are arranged the necessary buildings and sheds. The animals are lassoed in the pens by a man on horseback, and they are then forced through the corral gate into the inclosure, bellowing and plunging in every direction in a vain effort to escape. Sometimes the animals are thrown down by another lasso passed around their hind legs, when they are readily dispatched; but in most cases the butcher with an immense knife in his hand takes his opportunity to hamstring the brute before him, thus at once bringing it to the ground, when the knife is driven into its neck behind the horns, severing the spinal cord. Frequently, however, the hamstringing is only partially done or unsuccessfully attempted, and the bleeding animal, infuriated in its struggle for freedom, the chance of which is lessened every moment by the tightened lasso, the wounded leg, and the loss of blood, suffers all sorts of torture from men and dogs before it finally succumbs to its fate. This same brutal operation is at the same time going on in each one of the corrals; while scattered at intervals in the inclosure a number of men are engaged in skinning and disemboweling the animals while others are cutting up and

placing the carcasses in carts for the different city markets. The sight is a most repellant one, and no person with weak nerves or a humane heart would care to witness it twice. All these city establishments are under the control of the municipal authorities, not merely for the collection of the taxes on each head but to inspect the meat; but the latter duty is most carelessly attended to, and the amount of unhealthy beef which is sold in the city of Buenos Ayres is, according to the physicians, little less than appalling.

EFFORTS TO IMPROVE THE ARGENTINE BREED.

Thus far in my report, I have exclusively referred to the native (*creole*) breed of cattle of this Republic.* I have done this for the reason that scarcely any other kind reaches the slaughtering establishments. It must not be understood, however, that there are no blood cattle in the country. During the last few years very commendable efforts have been made, especially in the province of Buenos Ayres, to improve the breed, and some of the best breeding stock of Great Britain has been imported, in some cases commanding extravagant prices. These have mostly been Shorthorns or Durhams, though more recently some valuable acquisitions of Hereford bulls have been made. The effect of these crosses with *creole* cows cannot yet be fully determined. So far as the milk-producing qualities of the cross is concerned, of course there is no question; but milk is just now a matter of small consideration among *estancieros*, who never milk a cow.

On two points, however, there is a very serious question. These are, first, the quality of the hides produced by the cross; and, second, the ability of the cross to "rough it" during the long winter months.

* Mr. Darwin, in his "Naturalist's Voyage around the World," page 146, describes a very curious native breed which he says he met with on two occasions on the Upper Uruguay River. I have never seen the breed, but I give his description. He says: "They are called *nata* or *niata*. They appear externally to hold nearly the same relation to other cattle which bull or pug dogs do to other dogs. Their forehead is very short and broad, with the nasal end turned up and the upper lip much drawn back; their lower jaws project beyond the upper, and have a corresponding upward curve; hence their teeth are always exposed. Their nostrils are seated high up and are very open; their eyes project outward. When walking they carry their heads low, on a short neck; and their hind legs are rather longer compared with the front legs than usual. Their bare teeth, their short heads, and upturned nostrils give them the most ludicrous self-confident air of defiance imaginable. Since my return, I have procured a skeliton head, which is now deposited in the College of Surgeons. Don F. Muniz, of Luxan kindly collected for me all the information which he could respecting this breed. From his account it seems that about eighty or ninety years ago they were rare and kept as curiosities at Buenos Ayres. The breed is universally believed to have originated among the Indians, southward of the Plata, and that it was with them the commonest kind. Even at this day those reared in the provinces, near the Plata, show their less civilized origin in being fiercer than common cattle, and in the cow early deserting her first calf, if visited too often or molested. It is a singular fact that an almost similar structure to the abnormal one of the *niata* breed, as I am informed by Dr. Falconer, characterizes that great extinct ruminant of India, the servitierium. The breed is very true, and a *niata* bull and cow invariably produce *niata* calf. A *niata* bull with a common cow or the reverse cross, produces offspring having an intermediate character, but with the *niata* characters strongly displayed. When the pasture is tolerably long, the *niata* cattle feed with tongue and palate, as well as common cattle; but during the great droughts, when so many cattle perish, the *niata* breed is under a great disadvantage, and would be exterminated if not attended to; for the common cattle are just able to keep alive by browsing with their lips on the twigs and reeds; this the *niatas* cannot do so well, as their lips do not join, and hence they are found to perish before the common cattle. This strikes me as a good illustration of how little we are able to judge from the ordinary habits of life, on what circumstances, occurring at long intervals only, the rarity or extinction of a species may be determined."

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In regard to the first point, I have the opinion of a large buyer of hides, that so soon as the cross with Durham bulls became appreciably felt in number, the price of Argentine hides would fall, owing to their depreciation in quality. At present, I believe the hides of this part of South America stand pre-eminent for their strength; and it hardly seems reasonable to suppose that to cross the native stock with a breed which has for a century or more been carefully wintered and pampered will have the effect to improve the quality of the hide. The reverse would naturally seem to be the effect. For this reason there is a growing preference manifested for the Hereford bulls, on the ground that they have been bred in a more natural way, have a far stronger hide than the Durham, and can better take care of themselves on the great plains of the Argentine Republic. For it must be borne in mind that no provision is ever made in this country for protecting cattle from the weather. Such a thing as cattle sheds or winter feeding is entirely unknown, and the cold winds and severe storms which come over the southwestern Andes prove fatal to immense numbers of the native cattle every year. And it cannot be considered strange if the offspring of blooded stock, which have received the best treatment of Europe, should be unable to retain a vigorous and healthy constitution under the hard conditions which they are subjected to here.

So far as the second point is concerned, it is probably true that the Herefords are better able to stand the winters of this country than the Durhams, but it is certain that neither has the enduring qualities of the native cattle that for three hundred years, through all sorts of rough weather, have become accustomed to look out for themselves. And it must be admitted that, so far as body and weight are considered, the native breed has much to recommend it besides its hide. In some respects these cattle remind me of what at home we call the Texas or Arkansas "stags," tall and long-bodied, with immense spreading horns, of no prevailing color, but of all colors; and when well filled out by the rich pasturage of the pampas they present a most stately, not to say handsome, appearance, the work oxen being wonderful specimens of strength and docility. It is only in the province of Buenos Ayres that any particular attempts have been made to improve the breed.

The last census (1881) classifies the stock of the province as follows:

Class.	Number in the province.	Value.
Native cattle	4,037,064	\$38,756,006
English and other blood animals	22,210	4,443,800
Mixed breeds (English and native)	388,059	7,721,180
Work oxen	88,008	2,816,256
Milch cows	221,440	6,200,006
Total	4,754,810	59,937,242

MILCH COWS AND BUTTER-MAKING IN THE ARGENTINE REPUBLIC.

The small number of milch cows in the province of Buenos Ayres compared with the total number of cattle will attract attention, while in the other provinces, could the figures be obtained, the discrepancy would be still greater; whereas in the United States over one-third of all the horned cattle of the country are cows kept for dairy purposes. This shows the meager proportions which the latter industry has yet

assumed in the Argentine Republic. Indeed, in the census of this province, which has just been published, the figures are so insignificant that no returns whatever are given of the amount of the milk, butter, and cheese produced. Cows are never milked without the presence of the calf to start the milk; and even then the cows are so unaccustomed to the operation that they have frequently to be kept lassoed to a stake. In this city milk is either delivered at the door by milkmen (*lecheros*) who come in from the country on horseback bringing the fluid in tin cans balanced on each side of a pack-saddle; or, what is perhaps more usual, the cows with their calves tied to their tails, are driven through the streets morning and evening, and the quantity which each customer desires is milked at his door. The appearance of these droves of cows on the streets with their calves pulled along behind them is quite ludicrous to foreigners, and illustrates the primitive condition of the dairy industry in this country. Milk sells in this city for 8 cents a pint, and butter for 40 to 60 cents per pound.

I will not assume to say that Yankee churns are unknown in this country, but a good portion of the butter which finds its way to the city is churned by the *lecheros* on horseback, on their journey to town, by the mere jolting of some cream in the tin cans strapped across the horse's back. But the most novel mode of making butter in the interior is to fill a bag made of hide with sour cream, then fasten the bag to one end of a long hide rope and attach the other to the leather girth around a horse's body, which is then mounted by a *gaucho* and ridden at a break-neck pace over the pampa for a sufficient length of time to secure the making of the butter by bumping the milk-bag against the ground. I doubt if a patent-right for this invention would sell in the United States.

PRICES OF CATTLE IN THE ARGENTINE REPUBLIC.

In regard to the prices of native animals, there are considerable fluctuations corresponding to the season. Cattle that have been safely wintered and have just entered upon the spring grasses, command better figures than cattle that are in bad condition after a long drought with the winter before them. Likewise for animals raised for slaughter there is considerable difference in the prices according to the locality. In the upper provinces, far removed from market, the price seldom exceeds \$10 to \$15 for steers; \$15 to \$18 for fat bullocks; milch cows, \$10 to \$15 with calf; without calf, \$8 to 10. In this city for the most part *novillos* of two years sell for \$10 to \$15; of three years, \$15 to \$20; fat bullocks, for \$30 to \$40; cows with calves, from \$12 to \$60; work oxen, \$25 to \$40. For the great slaughtering and curing establishments (*saladeros*) the cattle are bought at the *estancias* in droves at so much a head, generally from \$8 to \$12 "*al corte*,"* while for breeding purposes the price is still less when sold in large numbers, say from \$5 to \$8 per head all round.

**Al corte* means "at the cut off," and is an expression which owes its existence to the old custom, at the time of the purchase, of separating a part of the herd containing the old and the young at a hazard as to the number of head, and the purchaser is obliged to take the quantity of cattle "cut-off," at the price per head fixed before hand, whether the animal be old or young, diseased or healthy. At present it is more usual to put the animals into the corral, where the gate is opened only wide enough to allow the escape of one at a time. The animals are thus counted, as they pass through, by the parties interested; and the number being filled, the gate is closed.

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CAPITAL REQUIRED TO START AN ESTANCIA IN THE ARGENTINE REPUBLIC.

The outlay necessary for starting a cattle *estancia* depends upon its location, and its annual product depends very much upon fortuitous circumstances. In regard to the first point, of course the capital required will be greater in the province of Buenos Ayres than on the frontiers, west and south, or in the interior provinces, for the reason that the former lands, command higher prices, the prices decreasing as the distance from Buenos Ayres increases. In regard to the second point, it must be borne in mind that protracted droughts (*secas*) are not unusual in this country, during which thousands upon thousands of stock die from thirst and starvation, while the severe rain and snow storms of winter, frequently carry off other thousands upon thousands of unprotected cattle. For these two reasons any estimates on these subjects cannot be implicitly relied upon. Mr. Ricardo Nap, a well-known statistician of this city, has presented some figures, which for a good year I suppose may be taken as approximately accurate. He assumes that a league square of pasture-land, with the necessary buildings included, has been purchased in the province of Buenos Ayres for \$40,000 (a similar quality of land farther out can be purchased for \$20,000 to \$30,000 per league, while on the frontiers it can be obtained for \$4,000 to \$10,000 per league). He then assumes that it is stocked with both cattle and sheep as follows:

10,000 sheep, <i>al corte</i> , at \$1.10	\$11,000
1,000 horned cattle, <i>al corte</i> , at \$6	6,000
300 mares, at \$4	1,200
50 saddle horses for use, at \$16	800

Outlay in the purchase of cattle 19,000

The capital fund for land and cattle will then be \$59,000, gold; and he calculates the annual product as follows:

2,500 sheep, sold to tallow establishments, at \$2	\$5,000
1,000 sheep, <i>al corte</i> , at \$1.20	1,200
150 horned cattle for the butcher, at \$14	2,100
100, <i>al corte</i> , at \$6	600
25 mares sold, at \$4	100

Augmentation and product of the year	9,000
Also 400 quintals of wool, at \$12	\$4,800
Also 3 quintals of hair, at \$20	60
	4,860

Gross proceeds 13,860

He deducts expenses as follows:

Salary of the manager, per annum	\$240
Salary of two servants, per annum	280
Salary of six shepherds and peons, per annum	1,080
Sundry expenses	26
	1,860

Which, according to his figures, leaves a net gain of 12,000

This is nearly 21 per cent. on the amount of the investment, and he gives this as the lowest estimate; but, taking the years as they run, with the losses which almost inevitably occur from the causes I have mentioned, and I doubt if the profit would exceed 12 to 15 per cent. on the investment when the balance-sheet is fully made up. In good years, and these do sometimes occur, the profit may even go to 30 per cent., but this is not likely to happen very often.

It will be observed that there is no item in the above expense account for food. This is because the animals on the place furnish the aliment, which is almost exclusively meat, while the skins, hide, tallow, an suet of the animals butchered for consumption pays nearly, if not all the small expenses; and, as Mr. Nap says, "it is exactly in the absence of small expenses that the principal gains of the pastoral industry are found in the Argentine Republic," no other provision whatever, save what the pampas furnish, being required or at least ever made use of for the maintenance of the animals when the pasturage gives out.

The above estimate is made on the basis that the estancia is partially stocked with sheep—and I am informed that such estancias are really the most profitable—but many of those more remote from this city are exclusively devoted to horned cattle. Three thousand horned cattle being the number usually allowed to a league of land, it is easy to change the calculations in the estimate to correspond to that basis.

Whatever may be the actual per cent. of profit which is realized from cattle farming, it is yet certain that the business is lucrative, since those who are engaged in this branch of industry have become the rich men of the country, many of them having amassed immense fortunes. It is true, however, that the increase in the value of their lands has in some cases had more to do with their wealth than the product of the pasturage. I know many cases where the value of well-situated estancias has doubled in the course of a few years, to say nothing whatever of the product.

FUTURE OF THE CATTLE INDUSTRY OF THE ARGENTINE REPUBLIC.

I have undertaken in the foregoing pages to furnish the Department with an exhibit drawn from the most reliable sources at my command of this leading industry of the Argentine Republic, its history, its wonderful development, its details, its products, and its profits. What I have accomplished is perhaps hardly what might have been expected in reply to the circular which was sent to me; but a strict compliance therewith was impossible, from the fact that there are no horned cattle in this country whose importation would be an improvement to our existing breeds and to productions of the dairy. At the same time, however, it has seemed to me that the manner in which the great cattle estancias of the river a Plate are managed and made productive was matter of sufficient interest, not merely to our cattle-breeders but to our people generally, to warrant the extended mention I have made of them, even though they offer but few points which it would be worth while for us to imitate.

In my opinion, however, the cattle industry of this country, if not in its infancy, is still in its undeveloped state, and that it will hereafter assume far greater proportions and be prosecuted with far better results than it has yet done. In the past cattle were only raised in this country for their hides; at present they are raised for their hides and the product of their carcasses. The time is coming, with the influx of intelligent labor from Europe, when to these the products of the dairy will also be added. To this end it is necessary that an improved breed, perhaps the cross of the Hereford with the native cow, shall take the place of the native (*creole*) cattle, which at present constitute the stock of the country. This change is now gradually going on, and a few more years will shown a vast difference in the qualities of the breed, while the production of milk, butter, and cheese will double, if not treble, the present

value of the industry. I should not, indeed, be surprised if the Argentine Republic should yet share with the United States the business of supplying the Old World not only with its principal aliment, meat, at a moderate price, but likewise with all the products of the dairy.

The introduction of blooded cattle and their crosses with the native will of course require that they should also receive greater care; but, when there has been established a more intimate connection between husbandry and the breeding of cattle, this also will come. Alfalfa and other succulent grasses will be grown and harvested to secure them from possible starvation during the winter months; while sheds or great belts of timber will be planted to protect them from destroying storms. The country, all these years, has gone on the idea that the industry needed no other care than the gathering of its produce; and that, as the millions of cattle, which fed on the spontaneous grasses of the pampas, increased and multiplied without any attention from the proprietors, there was nothing more to be desired. It is these natural advantages which have in great part caused the negligence which has attended this industry. Everything has been left to nature, without reflecting that it is very necessary to assist it, and in some cases even direct it, in order to have it yield its best results. But the old ways of the cattle-growers will give place to the improved methods of other countries; the advantages which the Argentine Republic offers for the raising of cattle on the largest scale will be supplemented by their scientific appreciation and utilization, and the industry will take a new departure of increased production and of increased wealth to the nation.

E. L. BAKER,
Consul.

UNITED STATES CONSULATE,
Buenos Ayres, November 24, 1883.

URUGUAY.

CATTLE AND CATTLE-BREEDING IN URUGUAY.

EXTRACTS FROM A REPORT (PUBLISHED IN CONSULAR REPORT No. 73, FOR FEBRUARY, 1887), BY MR. JOHN E. BACON, CHARGÉ D'AFFAIRES AT MONTEVIDEO.

CLIMATE.

The climate is by no means tropical, but temperate, somewhat similar to that of the Chestnut range of Upper Italy.

The thermometer (Fahrenheit's) scarcely ever marks 95 degrees in the summer, the general mean being about 65, and should the degree of 90 remain for two days it invariably gives rise to a thunder-storm, which cools and freshens the air in the most astonishing manner. The winters are mild, and though frosts are frequent in June and July, they do not affect the vegetation to any extent. The air is unusually pure, the atmosphere even in Montevideo, notwithstanding the location of the city immediately on the sea and river, quite dry. Indeed, the whole Republic enjoys an enviable reputation for salubrity.

VALUE OF LANDS AND STOCK.

The aggregate value of real estate and stock was estimated officially in 1883 at \$237,496,092, and is now supposed to be at least a fourth more, \$296,870,115. To this should be added about \$125,000,000 invested in other property, making in all \$421,870,115.

The proprietors of the lands and stock are reckoned at 41,760, and it will be a little strange to know that more than one-half of this property is owned by foreigners, as will appear from the following table copied from the *Estadística-General* for 1885:

Nationality of proprietors.	Department of Montevideo.		Other departments.		Total.	
	Proprietors.	Value of property.	Proprietors.	Value of property.	Proprietors.	Value of property.
Uruguayans	3,568	\$34,717,508	14,669	\$696,940 16	18,237	\$103,411,322
Italians	3,633	15,861,440	2,849	6,928,622 00	6,482	22,790,062
Spaniards	1,995	10,501,977	4,643	17,327,466 00	6,638	27,829,443
French	1,072	7,371,070	1,523	6,095,601 00	2,595	13,466,761
English	184	1,993,504	379	6,549,059 00	513	8,542,563
Germans	83	800,120	244	1,790,545 00	237	2,590,665
Portuguese	77	667,662	229	1,255,270 00	306	1,922,932
Argentines	144	1,877,230	1,599	2,229,749 00	743	4,106,979
Brazilians	43	543,233	5,543	50,998,311 00	5,586	51,541,544
Salcos	40	194,792	205	434,493 00	245	629,285
Americans	10	51,140	16	96,837 00	26	147,977
Belgians	3	23,800	7	51,412 00	10	75,212
Africans	5	8,600	.....	.....	5	3,600
Danes	1	39,890	.....	.....	1	39,890
Austrians	8	37,870	6	19,740 00	14	57,619
Greeks	2	2,060	.....	.....	2	2,060
Swede-Norwegians	2	4,422	5	10,788 00	7	15,210
Chilians .....	.....	.....	11	126,182 00	11	126,182
Paraguayans .....	.....	.....	16	14,261 00	16	14,261
Dutch .....	.....	.....	2	15,450 00	2	15,450
All other .....	.....	.....	.....	165,505 00	.....	165,505
Total	10,820	74,601,318	30,940	162,804,774 00	41,760	237,496,092

RÉSUMÉ.

Nationality of proprietors.	Department of Montevideo.		Other departments.		Total.	
	Proprietors.	Value of property.	Proprietors.	Value of property.	Proprietors.	Value of property.
Nacionales (nationalists).....	\$3,508	34,717,508	14,600	\$68,604,014 00	18,237	\$103,411,523
Estrangeros (foreigners).....	7,252	30,073,810	10,271	94,110,760 00	23,523	134,084,570
Total.....	10,820	74,691,318	30,940	162,804,774 00	41,760	237,496,029

In proportion to the population the number of live stock is enormous. According to the tax returns for 1883 there were in the Republic the following: Horned cattle, 5,967,634; oxen, 92,767.

SLAUGHTER OF CATTLE AND EXPORT OF BEEF.

The inquiry very naturally suggests itself, What becomes of the increase of such immense herds and flocks of cattle and sheep (8,000,000 cattle, 20,000,000 sheep) in a country containing only 700,000 inhabitants?

The greater part of it is thus accounted for:

Of horned cattle (home meat supply), in which is included the beef furnished to the respective naval squadrons in Montevidean waters...head..	502,000
Live cattle exported per annum.....	102,000
Killed in <i>saladeros</i> (slaughter-houses) per annum.....	704,000
Total.....	1,308,000

The exportation in 1883 showed as follows:

Jerked beef or dried meat	pounds..	76,706,770
Pressed meat	do....	3,326,751
Extract of meat	do....	1,099,630
Grease	do....	37,601,739
Tallow-skins	do....	11,547,590
Artificial guano (refuse meat, bones, &c.)	do....	9,000,000
Hair	do....	3,250,102
Cow-hides	number..	1,638,730
Living sheep	do....	142,000

These *saladeros* (literally, salting places) are peculiar to the river Plate, especially to Uruguay and the Argentine Republic. In the vicinity of Montevideo there are nine *saladeros*, the principal one being that at the "Cerro" (little mount), across the bay from the city, where, according to Mulhall, 200,000 head of cattle are killed annually, and he states that "when the wind comes from that quarter the smell in Montevideo is disagreeable." I must say that I have not as yet experienced this disagreeable smell, nor can I find any one who has.

On the river Uruguay there are a dozen or more of these *saladeros*, including the famous Liebig Extract of Meat Company. There are from 600,000 to 700,000 head of cattle slaughtered at these *saladeros* every season, besides a vast number of sheep, and from 50,000 to 80,000 mares. "The hides, tallow, grease, and other products of these establishments," says a recent writer, "involve the turning over annually of £2,500,000 to £3,000,000."

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Proprietors.	Value of property.
237	\$103,411,322
482	22,700,062
638	27,820,843
595	13,466,781
513	8,542,563
237	2,500,065
306	1,022,302
743	4,106,970
586	51,541,544
245	629,235
20	147,977
10	75,212
5	3,000
1	30,800
14	57,619
2	2,000
7	15,210
11	128,183
10	14,261
2	16,450
...	165,505
00	237,496,029

The same author (anonymous, but whose book is issued by the authority of the consulate-general of Uruguay, London, 1883) estimates the "commercial value of an ox, young and in good condition," as follows:

Hide, 68 pounds, at 71 reals per 75 pounds.....	\$6 43
Tallow, 40 pounds, at 13 reals per 25 pounds.....	2 04
Meat, 150 pounds, at 55 reals per quintal of 100 pounds.....	9 90
Remnants.....	50
Total.....	18 87

The saladero expenses for each animal are about \$3.60.

THE LIEBIG EXTRACT OF BEEF FACTORY.

The "Liebig Extract of Beef" has now a world-wide reputation; indeed, I believe that it has become the universal prescription for debility and prostration. The factory is located in this Republic, at Fray Bentos, in the department of Rio Negro, on the river Uruguay. It employs over 500 men, and loads at its own wharves upwards of 80 vessels during the year for the export of the produce to Europe. As this factory and its extract have become so famous, they merit more than a passing notice. Indeed, it must be a matter of interest and curiosity to the thousands of invalids who daily consume the Liebig extract to know how it is made.

The best description given of it is by Mr. Rathbone, in his report to the Orange Estancia Company, Liverpool, from which we will make such extracts as our limited space will allow:

The cattle are, on arrival, driven into large corrals, arranged so as to supply them with water, but no food is given to them. A long, narrow passage, about 6 or 7 feet wide, and skirted by a long, narrow platform pathway, about the height of the animal's horns, leads down to a small paddock, with a similar pathway around and a bridge over the opening into the galpon, which is further closed by a movable beam. Below the bridge is a large, low, square iron truck on a tramway which runs into the galpon, and branches into two parallel lines, so that the two trucks may pass each other. Along the left side of the shed are long ranges of rails for laying the oxen upon. At the end of the shed is a large brine bath for soaking the skins, and beyond this there are further sheds where the skins are piled up with salt previous to being shipped. In saladeros the skins are generally salted, but on estancias the hides are usually dried. As I arrived, about fifty oxen were being hunted down the "race" or paddock into the fatal paddock.

When the paddock was full and the gate shut, a man with a lasso, of which one end was attached to a steam winch outside (natives call it the English horse), went round the pathway and threw the noose over the most prominent horns he could see, which were by no means ordinarily the nearest to the bridge. The winch being set going, the beast was hauled, stumbling and slipping and pushing aside all animals in its way, till its head was choked up against the other beam leading into the galpon, upon which stood the killer, who, with a stab close behind the head with a large dagger-bladed knife, cut the spinal cord, and the animal at once dropped with a heavy thud, but without a struggle, onto the iron truck; the lower beam was then rapidly withdrawn, the lasso disengaged, and the truck run into the galpon by the men. Here, by means of a lasso attached to a horse, the animal was hitched into its place at the side of the shed, where a skinner was waiting for it, who immediately cut its throat and began to skin it. The blood was caught in large scoops and ladled into casks placed for the purpose. Meanwhile the skinner rapidly took the skin off, and, though sensation was probably thoroughly destroyed by severance of the spinal cord, yet muscular action was not, and it was rather ghastly to see the struggles of an animal with half its skin off, and even to detect a sound painfully like a bellow. These movements seem to take place when certain nerves were touched about the neck, and thus set in action. The skin off, it was taken to the brine bath spoken of, the entrails were taken out and carried away, the ribs cleared of flesh, and the limbs cut off and

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taken to the opposite side of the galpon, and there all the meat was cut from the bones and hung up on the rails provided for that purpose, together with that cut off the ribs, &c., still warm and quivering with life. The skull and horns were taken in a different direction. This operation takes from eight to nine minutes on an average, but on occasions has been done in five, and the skinner waits his next turn, which comes every fifteen minutes. As the truck is run out, the alternative truck is run into the paddock and the beam shot back for another victim.

The shed contains about 25 oxen at a time, so that about 100 are killed, skinned, and cut up in an hour, and in the height of the killing season as many as 1,200 are thus disposed of per diem, or from 100,000 to 150,000 a season. Each skinner gets 6 pence per head, but if in skinning he makes a hole in the skin he loses his payment. In the height of the season he disposes of about 33 in a day.

After 150 were disposed of, in an hour and a half, the remainder were left till after breakfast, and the place was cleaned up in a marvelously short time, making it difficult to believe that such a scene of blood had been taking place so recently. * * * When it has cooled, the meat is cleared of fat and is stewed in large oblong caldrons, in which the water is kept somewhat below boiling point, as it is a peculiarity of the extract that it contains no matter which is not soluble in cold as distinguished from boiling water. The thin soap so obtained is then strained off and carefully skimmed, which removes any trace of grease that may have remained in the meat. It is then passed through a series of elaborate evaporators, out of each of which it comes thicker until it reaches a consistency rather more solid than treacle. As much as 90,000 gallons of water a day is sometimes thus evaporated. It is now ready for use and is packed in large cube tins holding about 110 pounds of the extract; each of these tins contains on an average the substance of 15 animals, and is worth about £50.

Tin shops, carpenter shops, engineers' rooms, &c., on a complete scale are attached to the factory. There are also churches, schools, and houses for the operatives.

I will simply add that a higher price is asked here for the extract than in the United States, and that, strange to say, what is termed the "English Extract" is cheaper than either the Uruguayan or American. The solution of this, I am advised, is found in the fact that the Uruguayan is unadulterated, and the English and American, after being shipped from here, is returned adulterated, or rather weakened, so as to undersell the former. Whether this be so or not I cannot say, but I do know that the English brand is cheaper in this market than the Uruguayan, or, at least, that I paid higher for the latter.

FROZEN-MEAT TRADE.

The principal wealth of the Plate countries consists in herds and flocks, and so rich are they in these that every possible attention and effort have been given to solve the vexed problem, "What shall we do with our surplus beef and mutton?"

Experience has taught the farmers that the shipping of live stock will not pay; the voyage being too long, say from 20 to 30 days by steamer to France, England, Germany, and Italy, and as a consequence the freights, including the feed, are very high.

For some time jerked beef answered for the purpose, but by degrees the frozen-meat trade has been resorted to and made successful.

In the Argentine Confederation alone there are said to be now 100,000,000 sheep, besides immense herds of cattle, and, as the pastures are apparently inexhaustible, the increase of such immense herds and flocks must be prodigious and beyond all conceivable use for a population of only 3,000,000.

In Uruguay, likewise, with a population of about 700,000, there are said to be now (1886) over 8,000,000 cattle and 20,000,000 sheep.

It will therefore be easily seen that this frozen-meat trade, if ultimately successful, will assume gigantic dimensions. The question has

become so important that legislation for its encouragement and development has been resorted to, and a certain interest guaranteed by Government upon all capital invested in factories of frozen carcasses.

For instance, in this Republic, Uruguay, it has been lately enacted, in order to assist the development of the export of meat, that the state will guarantee an annual interest of 6 per cent. upon all companies that shall establish themselves within the Republic for the purpose of exporting fresh meat, with a capital of not less than \$500,000, to be increased to 7 per cent. when the capital is not less than \$3,000,000, the total capital to be thus guaranteed, however, not to exceed \$6,000,000.

This guarantee is subject to the following conditions:

(4) No guarantee to be granted until the proposer shall have deposited in one of the banks of the capital a sum equal to 1 per cent. of the amount of capital upon which the guarantee is asked. This deposit may be made in coin, or in Uruguayan bonds at the market value, or in real estate. In this last case the owner still to receive the revenue derived from such property.

(5) So soon as the company satisfies the Government that work has been done in the country equivalent to the amount of deposit, such deposit to be returned. In the event of the enterprise not being carried out within the legal period stipulated, the deposit shall be forfeited to the state, in accordance with article 14.

(6) Before any payment can be made on behalf of guarantee, the companies must satisfy the Government that they have complied with the following conditions:

(a) That they have employed in the country in constructive works, on land and afloat, a capital of not less than \$100,000, if acting under article 1, or of \$500,000, if acting under article 2.

(b) That the annual export has actually amounted to a minimum of 15,000 head of cattle or 120,000 sheep for each \$500,000 of capital.

(7) The guarantee to be granted upon the capital actually raised for these enterprises, including that employed in the construction of establishments in the country and also the working capital in circulation.

(8) This guarantee to be granted only once, and in no case will the duration of the guarantee exceed ten years.

(9) When the companies earn more than 10 per cent. per annum they will be liable to refund to the Government the excess until they shall have repaid any sums received to make up the guaranteed interest.

(10) The executive power is authorized to sanction the operations of the companies in such localities as they may select for the establishment of freezing depots, when these do not act to the prejudice of other interests, and conform to the law of the Republic.

(11) The steamers of the companies will enjoy packet privileges.

(12) Companies will be at liberty to give up the guarantee at any time, provided they repay to the state all sums received as guaranteed interest. When this is done, the official inspection of their operations will cease, but all their other privileges will continue as before.

(13) In case the state be called upon to make up the interest to the guaranteed rate, the executive power is authorized by this law to take the sum required out of the general revenue of the country, and in case of there not being sufficient funds, it will at once propose to the legislative body to grant the sum necessary for payment.

(14) The executive power is hereby authorized to concede at once guarantees to the company or companies which, in its judgment, are prepared to fulfill the conditions laid down in this law, but cannot allow more than two years for the installation of the works. In the event

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(15) The executive power will make arrangements for the inspection of the companies' operations, and take the necessary steps to secure the compliance with this law.

In addition to this, the subject receives the greatest attention from the rural societies, agricultural clubs, &c.

Indeed the interest manifested in regard to this trade by the valley of the Plate (chiefly Uruguay and the Argentine Republic) is ably supplemented by capitalists in England, France, Germany, and Italy; especially by the owners of the many steamboat lines between those countries and the River Plate Republic, as its success would fill their steamers to repletion with freights.

The Zenoha, for instance, lately carried, at one time, 13,536 carcasses of frozen sheep and 335 quarters of beef, at $3\frac{3}{4}$ to $4\frac{1}{2}$ pence per pound for the mutton, and $2\frac{1}{2}$ to 5 pence for the beef.

In addition to other meetings in different parts of Europe for encouraging this trade, the papers allude to one lately held at Hamburg, convened by Herr Pedro Beck, at which the matter was thoroughly discussed and a proposition made for an investment of 3,000,000 marks to assist the trade between that port and the river Plate.

The great struggle now, as to what country shall monopolize this frozen-meat trade, seems to lie between the United States, Australia, New Zealand, the Argentine Republic, and Uruguay.

The transportation of frozen meat has become an undoubted success, and sooner or later, in the opinion of the best-informed parties, will entirely supersede that of the transportation of live stock.

If this be true, the subject becomes of vast importance to the United States, and especially to Chicago, the principal shipping point to England. My attention of late has been forcibly directed to this point by reading in the papers here of meetings, where this matter, so far as it affected the United States and Chicago, was thoroughly discussed. In point of fact, not only the Governments here (as will be seen from the guarantees by Uruguay of 6 or 7 per cent. to frozen-meat investments above referred to), but wealthy capitalists, backed by the wealth and intelligence of the *estancieros* (large farmers), are apparently more interested at present in devising ways and means to wrest this trade from the United States, Australia, and New Zealand than in any other. In order to do this, they have procured the fullest and most minute information as to the amount of live stock and frozen meat sent from those countries, where it is sent to, at what prices, freights, &c. For instance, I read not long since of a meeting where it was stated, upon the authority of the Times, that the freights from the ranches in the United States, to Chicago, would average 32 shillings per head; from Chicago to New York, a sovereign; and the cost for shipping a carcass or live beast onward to Liverpool is about 50 shillings; that a beast on the plains is worth, roughly, £4, and that, therefore, American fat cattle, dead or alive, would cost in England little less than £10 apiece, and showing by an accurate calculation that the same beast or carcass could be laid down in England for half that price.

An article from the New York Daily Commercial Bulletin was also commented upon, stating, among other things, that a large amount of jerked beef was annually exported by Argentine and Uruguay, the importations to Brazil and Cuba alone amounting last year, respectively, to these countries, to \$1,700,000 and \$1,143,000; that no attempt

had been made in the United States to compete with Argentine and Uruguay, the only exporters of jerked beef, and it would doubtless be difficult to do so, as the cost of the cattle is much greater in this country. Their transportation facilities to the West Indies are better than ours, notwithstanding the difference in the distance, and a steamer leaves Buenos Ayres for the Brazilian ports every day.

The jerked-beef trade is likewise demanding constant attention. Indeed, there is a society in Montevideo, supported mainly by the Government, with the view of opening new markets for the sale of this product. It is said that a great effort will be made by this society to provide ways and means for substituting in the foreign markets jerked beef for codfish from Sweden and Norway. They claim that the jerked beef is much cheaper and much more nutritious than the codfish, and that no other meat is so healthy; that it can be laid down, free from bone and moisture, in Europe at 5 cents per pound, about one-fourth less than the cost of the codfish; indeed, they go so far as to say that the nutritive value of jerked beef, pound for pound, is greater than that of fresh meat.

About a year ago the Buenos Ayres Standard (owned by the famous statistician Mulhall) contended that, allowing $1\frac{1}{2}$ pence per pound and $1\frac{1}{2}$ for freight, Merino mutton could be placed on the London wharves at 3 pence per pound. A New Zealand correspondent, noticing this, asserts that it cannot be done for less than $3\frac{1}{2}$ pence per pound, but after commenting upon the importation of mutton from Australia, New Zealand, and the Plate, he admits that, "in Merino and the lower grades of mutton, it is only a matter of time for the Plate to smother our Australian neighbors, and drive them out of the English market by advantages which the former possess of a slightly lower cost of production and a much lower freight to England."

A sufficiency of transportation is also being provided. In connection with this it is stated, by way of example, that at Montevideo is in daily communication with England by telegraph, and almost so by steam, no less than 217 steamers having left England for Uruguay in 1884, besides 198 sailing vessels; making a total of 415, or considerably more than one per diem.

The question, therefore, of freight for the exportation of jerked beef in the returning vessels presents no difficulty. When to this is added that the French and Italian lines are daily going and coming between Montevideo and their respective ports, to say nothing of the sailing vessels of the different nationalities, it will be seen that the country will not suffer for want of freight. Indeed, I am told that the rivalry between the respective lines and boats is so great as to render freights comparatively cheap.

I have bestowed much time and consideration upon this subject. It is of vital importance to the United States, so far as the transportation of frozen beef is concerned, and it is highly important that it should be known that the wealthy, astute, and energetic capitalists of the Plate countries, backed by the money from England, France, Italy, and Germany, are endeavoring, not only to compete with the trade of the United States in this regard, but to rival and finally supersede it.

The Republics of Argentina and Uruguay and Paraguay alone possess over 37,000,000 head of cattle and sheep. Indeed, in a comparison contained in one of the leading journals here, it is stated that there are over 1,500 cattle to every hundred inhabitants of the Plate country, and only a little over 70 cattle to the hundred in the United States. This may be, and I dare say is, exaggerated, though Mr. Curtis, if I

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am not mistaken, makes the difference still greater. The truth is, the statistics here are generally unreliable. At least I am so advised. The comparison, however, even dropping one-half of the 1,500, is astounding.

Besides this, there is no doubt of the great excellence of the pastures here, and of the succulence of the natural grasses and of their comparative inexhaustibility, nor can there be any doubt of the cheapness of beef, the tenderloin steaks selling in Montevidean markets at 6 cents per pound, and still less doubt that there will always be a sufficiency of transportation for all purposes.

In this connection I will state that the merchants, shippers, and capitalists of this city (Montevideo), composed, as they are, of all of the great nationalities—English, French, Spanish, German, and Italian—are unusually shrewd, intelligent, and experienced, and for any feasible plan can command, either themselves or through their European acquaintances and houses, any reasonable amount of capital. Indeed, owing to the low interest paid on money in Europe, generally millions upon millions, as the journals here state, are seeking investment at higher rates in the countries of the Plate.

As above stated, my attention was first directed to this subject by reading in the papers of the minutiae of the Chicago meat trade, how to compete with it, &c.

I will only add, in this regard, that there is now a petition before the Buenos Ayres legislature for aid in the transportation of frozen meat.

BRAZIL.

CATTLE IN BRAZIL.

REPORT BY CONSUL-GENERAL ANDREWS, OF RIO DE JANEIRO.

DIFFICULTY OF OBTAINING CATTLE STATISTICS IN BRAZIL.

I have for a long time had in mind the Department's circular of 18th July last in respect to breeding cattle, but owing to the difficulty of obtaining information here on such a subject, I have been delayed in giving a reply.

The so-called "department of agriculture, commerce, and public works of Brazil" is occupied principally with public works, and does not collect or publish statistics upon agriculture. Nor does there appear to be any society or organization which collects statistics on the subject in question. There has been published in this country for many years an Agricultural Review in the Portuguese language and I have carefully looked through all its back volumes, at the national library, with the hope that I could find some information in regard to breeding cattle. I found many articles on the subject, but they all related to English or other foreign stock. Not a particle of information could I find in respect to the cattle of Brazil.

I have had to resort, therefore, for the facts contained in this report wholly to personal inquiry.

BRAZILIAN CATTLE AND THE HOME MARKET.

A rough estimate puts the number of horned cattle in Brazil at 20,000,000 head.

Of course there are many and extensive areas in the interior with an altitude of 2,000 feet above the sea, well adapted for raising, and which now produce cattle; yet owing to their remoteness they are not available for supplying some of the best markets with beef. It is a striking fact that this city should have imported last year 54,000,000 pounds of dried beef from Uruguay and the Argentine Republic.

THE OLD NATIVE BRAZILIAN CATTLE.

The old native race of Brazilian cattle has long horns and a yellow-brown color. Having been introduced from Spain and Portugal over two centuries ago they have the same origin probably as those now found in California, New Mexico, and Texas, and are better adapted for producing oxen and beef than for dairy purposes.

The oxen of this breed are very large, being much larger, I should say, than are usually seen in the United States or in the north of Europe.

The accompanying photograph, taken in the interior of this province, of a team of four yoke of oxen, shows the native oxen of Brazil of medium size, but perhaps of less than usual flesh. The cart which they are drawing represents the kind in common use, having solid wooden

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During a recent tour which I made in the extensive agricultural province of San Paulo I saw some good specimens of the native cattle. A peculiarity of many of the cows is their resemblance to oxen in respect to head and neck, and not unfrequently in size. If there is any trait or quality of the Brazilian breed which could be profitably introduced into the United States it must be that, and I think only that, of size.

The accompanying is a photograph which I had taken of one of these cows at Piracicaba, a town 500 miles distant from here.

The local name of the breed of this cow is Caragua, and her measurement is as follows: Height, 4 feet 8 inches; length of body, 8 feet 2 inches; distance between tips of horns, 4 feet 7 inches; age, nine to ten years; estimated weight, 900 pounds.

The name of the owner of the cow is Mr. Bento Vollet, and of the photographer, Mr. Bernardo Newman. I saw cows of this breed which yielded about 12 quarts of milk per day.

MIXED BREEDS IN BRAZIL.

The Mesticos.—This long-horned breed is docile and is esteemed principally for draft. Mixed with breeds from Europe it has produced a stock called "Mesticos," which are large and good looking with smaller horns and yielding meat lightly, but of good flavor.

The Quiabanos.—The interior province of Malto Grosso produces a small bullock known as the "Quiabanos" breed (a name derived from the capital of the province), of rather wild inclination but affording good meat.

English breeds.—Of course in the principal cities and towns some of the best English breeds, such as the Shorthorns and Jerseys, have been introduced for family use.

The Turino.—The breed used almost exclusively for milk dairies in this and other large cities is called the "Turino." It is rather a large black and white cow with medium-sized horns, similar to those seen in the dairies of France and Switzerland, and yields milk abundantly, say 1,200 pounds per year.

BEEF AND DAIRY PRODUCT CONSUMPTION IN RIO DE JANEIRO.

The fact that most of the butter used in a city like this is the modern adulteration, imported in tin cans, is one of many proofs that might be adduced of the backward condition of the dairy industry in this country.

The city of Rio de Janeiro consumes in beef, on an average, 110,000 bullocks a year. These are principally killed in the public slaughter-house, at Santa Cruz, 9 miles distant on the railway, and the meat brought into the city in cars. From the station it is distributed towards evening in heavy four-mule carriages, which can be distinguished from all others by their rapid pace and heavy rumbling, to the retail shops, which latter, generally, dispose of all their meat early the next morning.

The cattle usually come from the two great provinces of Minas Geraes and San Paulo, being driven in herds of one hundred to one hundred and fifteen head each, over bad roads, and arrive in tired condition. They cannot be transported by railroad on account of the high freight



tariff. The average weight of a bullock when killed is only about 440 pounds inclusive of the hide, &c.

A tax is paid to the municipality of Rio de Janeiro of 4 milreis, say \$1.70, on each bullock, and the province from which it comes collects another tax of 2 milreis per head. The freight by railway from the slaughter-house to the city is about 50 cents for the four quarters.

The meat is retailed at about 11 cents per pound.

The measurement given in the accompanying form are, for length from base of horns to base of tail; of girth, around the animal just behind the fore legs.

C. C. ANDREWS,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
Rio de Janeiro, June 7, 1884.

SPECIAL STATISTICS CONCERNING BRAZILIAN CATTLE.

The common Brazilian attains the following measurements at maturity: Cow, 6 feet girth; bull, 7 feet girth; ox, 11 feet girth. The live weight of the cow is 440 pounds; of the bull, 700 pounds; of the ox, 1,200 pounds. The annual average production of milk is 720 pounds; 12 pounds of milk required to 1 of butter; 5 pounds of milk to 1 of cheese. The average value of product is, meat, \$20; milk, \$30 per year; cheese \$25 per year. The animals reach maturity at from four to five years. The color is a yellowish brown. They originate in Portugal and Spain.

The Furino, used for milk in large towns, produce annually, on an average, 1,200 pounds of milk. The cows measure 6 feet 1 inch in girth, 6 feet 4 inches in length. The substratum is 10 per cent. limestone; 30 per cent. sandstone; 20 per cent. granite; 20 per cent. clay; 20 per cent. gravel.

The cattle are not housed, except in towns. They feed on natural pasture. Breeding is but little attended to. Beef is generally handled on the hoof; milk, to some extent, by railway.

The altitude is 2,000 feet. The mean temperature 67° Fahrenheit; summer, 75°; winter, 56°.

The soil is 15 per cent. alluvial, 30 per cent. loam, 20 per cent. clay, and 35 per cent. sandy.

UNITED STATES OF COLOMBIA.

CATTLE ON THE PLAINS OF BOGOTA.

REPORT BY VICE-CONSUL BOSHELL.

The cattle of this country is not fit to be exported to the United States on account of their very inferior quality, and the accompanying form could not be filled, as there are no statistics to be obtained here.

Cattle brought from the warmer climate to the cooler plains of Bogota bring with them a pest called here "ranilla," which they transmit in their saliva to the grass, and which is almost always fatal to the animals raised in the cooler climate. The poison which the hot-country cattle bring with them blights the pastures for at least twelve months, and the grass has to be burnt several times during that period to eradicate the disease.

The hot-country cattle lose, after being months on this plain, the power of transmitting the above-mentioned disease.

MARTIN BOSHELL,
Vice-Consul in Charge.

UNITED STATES CONSULATE,
Bogota, December 5, 1883.

REMARKS.

The *Criollo* is a mixed breed between Spanish, Hertford, and Durham. There is no fixed rule as to color—red, black, white, and yellow.

The Hertfords have been bred pure since 1856.

The altitude of the plains of Bogota is 2,560 meters, medium term. The mean temperature is 15° centigrade; same climate all the year round.

Cattle are not housed here; they feed all the year round out in the fields. Breeding is left free. Products are handled as in primitive time.

ECUADOR.

CATTLE BREEDING AND PRODUCTS OF CATTLE IN ECUADOR.

REPORT BY CONSUL BEACH, OF GUAYAQUIL.

In response to circular of July 18, 1883, asking information in regard to the breeding cattle and cattle products in Ecuador, the following facts are given as derived from extensive cattle raisers in different sections:

THE SEASONS IN ECUADOR.

As an introduction, I will state that practically Ecuador has but two seasons of the year—the dry and the rainy. The first usually begins with June and ends with November, and the latter begins with December and ends with May. Each often begins or ends a month earlier or later than the dates given. The “winter,” or rainy season, is the warmest by from 5° to 10°. Vegetation of all kinds grows most rapidly during the rainy season, though the influence of the rain is extended for several weeks beyond its cessation. There is usually every year from four to five months when the pasturage is scarce and the cattle have poor subsistence. There are abundant mountain streams that during the dry period might be utilized at small expense in irrigating the land; but the people have not yet reached that degree of agricultural progress.

MILK YIELD.

During the dry season most of the cows give but little if any milk, and the figures given in the subjoined table are for the quantity realized in from six to eight months. The quantity stated (485 pounds average per cow per year) is given under the supposition that all the milk of the cow is included. The general practice is to let the calves run with the cows during the day, separate them at night in corrals, and milk the cows in the morning. Thus they are milked but once a day, and the quantity is not more than one-half of the product of the cow.

Breeds.—The cattle of the country are all “native stock,” and have been bred in and in from time immemorial; the only changes have been from one plantation to another. The effect of long inbreeding is degenerated animals—animals of small size—as shown by the table given, and they are of every known cattle hue. The planters inform me that there are no natural obstacles to the raising of as good stock here as in any other part of the world.

NUMBER AND VALUE OF ECUADORIAN CATTLE.

No well-authenticated census has ever been taken in Ecuador, either of the inhabitants or showing the extent of its industries and products. The actual population is approximated very closely, but there is no data showing the quantity or value of agricultural products, except of a very few articles, nearly all of which are exported, their quantity and value being derived from exportation statistics. In an endeavor to reach a conclusion as to the quantity and value of the cattle stock, I adopted different methods. I sought to get an estimate by provinces, but could

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only ascertain that near Santa Rosa every 25 miles square would contain 10,000 head; at Loga, the same area, 20,000 head, but for a large extent of the country no kind of an estimate could be obtained. Finally an estimate of the number of cattle killed in the country per day was made, based on known numbers of cattle consumed by a known number of inhabitants. By this method it was ascertained that the number of cattle slaughtered daily is about 1,000, or 365,000 per year. As the cattle are sold at an average of five years old it makes the whole number of live animals 1,825,000. The cattle are sold at an average of \$25, making the total value of annual sales \$9,125,000. The value of the whole stock, young and old, will average about \$18 per head, making total value \$32,850,000.

About three-fifths of the cattle raised are cows, and the other two-fifths steers and bulls. The steers are sold as soon as matured, but the cows are kept longer, all finally being sold for beef. Most of the cattle hides are exported to the United States; a few are used by the natives in making bags, "raw-hide ropes," "bed blankets," and the like.

CULTIVATED GRASSES IN ECUADOR.

The *alfalfa* is a very good grass, somewhat of the clover order, which yields largely when well cultivated. The *jenciro* is a specie of wild grass that grows luxuriantly in wet places, and while it is of inferior quality is in large demand during the dry season, and becomes valuable because always in supply; for four or five months in the year it is the principal food of the horses, mules, and donkeys, in Guayaquil, whose market is supplied by means of canoes.

PROFITABLENESS OF CATTLE RAISING IN ECUADOR.

Plantations are not dear, and by reason of perpetual pasturage cattle raising is one of the most profitable pursuits in Ecuador, and the business is increasing. But the business has some drawbacks, as about 5 per cent. of the stock is killed by tigers, and many animals are stolen. As there are many wild cattle, the result of strays from tame stock, the loss stated is sometimes partially offset by the capture of wild cattle.

HORATIO N. BEACH,
Consul.

UNITED STATES CONSULATE,
Guayaquil, October 26, 1883.

REMARKS.

The cattle are of Spanish origin. At maturity the cow weighs 500 pounds, the bull 600 pounds, and the ox 800 pounds. The annual average production of milk is 485 pounds. They arrive at maturity at from three to five years, usually at four. They are of every color. Oxen are but little used. All cattle are ultimately slaughtered for meat. Only a small part of the milk is sold. Cheese ranks next to meat in importance, but the value of this product is not known. The cattle are confined by corals. The only method of feeding is by pasture. The hides are mostly shipped. The altitude varies from 0 to 21,500 feet. The mean temperature is 60° Fahrenheit; in summer 55°, in winter 65°. The soil is a sandy loam on the coast, sandy, scoria, &c., in the interior.

PERU.

CATTLE IN PERU.

REPORT BY CONSUL LAPOINT, OF CHICLAYO.

I am in receipt of circular dated July 18, 1883, asking for information relative to breeding of cattle in this department.

In answer I am sorry to say that I am not able to give such information as the Department of State might require.

Cattle in this department are bred in a wild state and no attention is paid to the improvement of the breed. Whenever a supply is wanted, the owner of an estate surrounds his lands and collects the cattle which he requires to sell or to send to market. Milk and butter are very scarce articles, and only to be got on the farms. Peru does not produce sufficient cattle for its use, and large supplies are imported from Chili and the Argentine Republic for consumption in the south.

AMERICAN CATTLE FOR PERU.

I am sure that when the Panama Canal will be finished, and direct steam communication with the United States established, it will be a profitable business to introduce cattle from our country into Peru.

ALFRED LAPOINT,

Vice-Consul.

UNITED STATES CONSULATE,
Chiclayo, November 5, 1883.

VENEZUELA.

CATTLE INTERESTS IN VENEZUELA.

REPORT BY CONSUL BIRD, OF LA GUAYRA.

Certain specific inquiries with reference to cattle in Venezuela having been made by the Department of State through a circular letter lately received at this consulate, the following report is respectfully submitted. It will be observed that, owing to the difficulty of procuring intelligent and accurate information, the subject has been treated in a general manner, but it is hoped that the salient points have been so far recognized, that at least something more than a vague idea of this industry may be communicated, and that some of the matter herein presented may not be devoid of a certain degree of interest to those engaged in similar enterprises in the United States.

As the channels of trade and intercourse with the great pampas of the interior of Venezuela are inadequate to the maintenance of extensive interstate commerce and for the transportation to the seaboard at reasonable rates of agricultural produce; and as, in such a sparsely populated country, thus deprived of facilities for transportation and communication, the idea of anything like the existence of a home market is naturally precluded, so the attention and interest of the people has been directed to that branch of industry that, with comparatively little care or manual labor, will yield the surest and most remunerative returns, and that, when ready for the market, itself furnishes the means for its own inexpensive transportation.

The Republic of Venezuela has an area of territory of 439,119 square miles, a fraction larger than the States of Louisiana and Texas and the Territory of New Mexico combined; and a population of 2,075,245, not quite as large as that of the State of Missouri. In the interior of the country are vast plains of Government lands practically illimitable, isolated, and uninhabited, though well-watered, salubrious, and fertile, and especially adapted to the raising of cattle.

According to recent statistics there are 220,000 people engaged in this particular enterprise, though the number of cattle cannot be given with any degree of accuracy. Through the devastating internal revolutions from which the country suffered up to the year 1874, the large and flourishing herds of the plains, exposed to the constant and ruthless depredations of all the hostile armies, were practically decimated. They spared not and paid not; and hence not only were the flocks and herds destroyed, but the rich proprietors were generally reduced to penury and many even to a state of actual want. But under the unbroken peace that has subsisted for the past ten years, and the careful and unremitting efforts of the despoiled *Llaneros* to repair their severe losses, the revival of the industry is assured and the prosperity of the stock raisers reasonably restored.

From all available information and personal observation it may be stated that there is only one class of cattle in Venezuela; for, although there have been, from time to time, some experimental efforts to cross the breed by admixture with American and other stock, it is virtually unchanged. It may be called the Spanish-American breed, since it has

resulted from a cross of the native breed with the Spanish cattle imported in colonial times; but to call it "Texas cattle" would be quite as accurate, and would readily convey to our American people its true class and characteristics; for in all points the cattle of Texas and Venezuela appear to be identical.

The custom of collecting or "rounding up" the cattle of the different sections twice a year for the purpose of identifying, marking, and branding by individual owners, as is practiced in the State of Texas, is common here also; and this, together with the influence of wholesome laws supplemented by the vigorous enforcement of *cowboy regulations*, suffices to settle all doubtful or disputed questions of ownership.

The public domain supplies ample pasturage, where all stock runs untaxed and unrestricted; stock raisers and agriculturists paying no tax whatever to the Government, all the revenues of which are derived from duties levied on imports and exports. Of course it will be understood that on this vast pasture, lying between the sixth and ninth degrees of latitude north, no preparation for wintering stock is necessary; the climate being always from warm to temperate, and the grasses and herbage affording the requisite sustenance throughout the year.

While the price of stock may only be approximately given, it is safe to calculate it at not less than \$10 in United States currency per head on ordinary even running lots of cattle over two years old. They have been much higher even, owing to the late wars; but, with continued peace, prices must rule much lower. Owing doubtless to these high prices and the difficulties of transportation, there are no meat-canning establishments in the country; but, with these obstacles removed, the export of canned and refrigerated meats might be large and remunerative. The pasturage, as has been stated, is ample; and while it is quite impossible to give a technical classification of the different grasses, it may be sufficient to say that they comprise annual and perennial varieties of the best quality for raising and fattening cattle.

With all, however, that may be said upon the subject, it is proper to conclude that, at least for some years to come, our own Western prairies must continue to be the best home for the stock-raiser; where, with improved stock, sufficient pasturage, a good and convenient home and foreign market, just laws properly administered, and, *above all*, absolute safety from predatory bands of revolutionists, he may dwell safely in the land, rest serenely in his castle, and reap surely the increase of his flocks and herds.

UNITED STATES CONSULATE,
La Guayra, September 20, 1884.

W. S. BIRD,
Consul.

MARACAIBO.

REPORT BY CONSUL PLUMACHER.

I regret to state that I am unable to give any special information in answer to the Department circular. There are no improved breeds here. The cattle of this part of Venezuela run wild and are not even branded. They come mostly from the Indian country, known as the peninsula of the Goyara. Cattle here are only reared for their hides, and meat for daily consumption. As a rule only the milk of goats and asses is consumed.

UNITED STATES CONSULATE,
Maracaibo, November 30, 1883.

E. H. PLUMACHER,
Consul.

WEST INDIES.

CATTLE IN BERMUDA.

REPORT BY CONSUL ALLEN.

In reply to circular of July 18, 1883, requesting information relative to breeding cattle, I have to say no cattle are bred here that would have any value whatever as stock breeders in the United States.

The Bermuda cow is a small, scrawny animal, of a mongrel breed, is a poor milker, giving only about 3 quarts of milk per day for eight months of the year. A few cows have been imported from the United States and Canada, but they do not do well as a rule, and though well fed with grain, after one or two years they are no better than the native animals.

The Bermuda grass is not adapted to stock-raising, and while it will sustain animal life they will not thrive on it, and cows that are not fed with grain are very poor.

Neither butter nor cheese is made here.

The native beef is very poor and is rarely seen in the markets.

No oxen are used here, and the male calves are slaughtered for veal, except those kept for breeding purposes.

CHAS. M. ALLEN,
Consul.

UNITED STATES CONSULATE,
Bermuda, October 3, 1883.

CATTLE IN SAN DOMINGO.

REPORT BY CONSUL SIMPSON, OF PUERTO PLATA.

I have the honor to return herewith blank which accompanied cattle circular, filled to the best of my ability.

The origin of the breed of cattle on this island seems to be unknown, but is probably Spanish. They are small, give but little milk, and are mainly raised for the butcher.

Few are exported, and, as enough are raised for home consumption, few imported. Bulls are used exclusively for draft purposes. They are gentle and easily handled. No oxen are raised.

Cows have been imported from the United States, but they never seem to thrive, probably from the fact that they were imported from States too far north to suit this warm climate.

There does not seem to be much desire to change or improve the breed, although within a few days two bulls and one cow have been imported from Porto Rico. These animals are said to have come from Spain, and although not large are a decided improvement on the breed here.

THOMAS SIMPSON,
Consul.

UNITED STATES CONSULATE,
Puerto Plata, November 20, 1883.

REMARKS.

The annual average production of milk per cow is 2,920 pounds. No butter or cheese is made. The cattle arrive at maturity when three years old. The live weight of the cow is 300 pounds; of the bull and the ox, 450 pounds. The average weight of meat is 250 pounds. The cattle vary in color; their origin is unknown; they feed at large. There is no housing, and no system of breeding or of handling products. Cultivated grasses: Guinea grass.

The mean temperature is 81°; summer, 91°; winter, 72°.

CATTLE AND CATTLE PRODUCTS IN SAINT THOMAS.

REPORT BY CONSUL SMITH.

I am just in receipt of the cattle circular of July 18, 1883.

There is no information relative to the cattle of Saint Thomas that can be given which will be of any value to the stock-breeders of the United States. There being no fresh water on the island, and but little grass, stock is not bred for any purpose.

There are not to exceed two or three hundred head of cattle on the island. Of this number perhaps one hundred are ordinary Spanish milch cows.

IMPORTS OF CATTLE.

The supply of cattle for the butcher is drawn from the neighboring islands. During the fiscal year ending March 31, 1883, the importations were as follows:

Whence imported.	Head.	Value.
Other Danish West India Islands	145	\$0.150
British West India Islands	1,727	11,775
Spanish West India Islands	1,374	35,010
French West India Islands	20	256
Dutch West India Islands	80	1,165
Dominican Republic	3	40
Total	3,353	50,375

A few head are imported at a time in small sloops engaged in that trade.

MEAT IMPORTS FROM THE UNITED STATES.

The expense which would be incurred by keeping a large supply on hand precludes the butchers from negotiating with stock-breeders in the United States for the delivery of such cargoes as would be profitable for them to ship.

The salt and canned meats necessary to supply the demand of the shipping is imported from the United States.

BUTTER AND CHEESE IMPORTS.

Butter is chiefly imported from Denmark, and cheese from Germany and France.

Danish butter keeps better in this climate than does that of any other country. American dealers have frequently sent consignments here, and in most instances have sustained heavy losses thereon, either on account of the quality, or in consequence of its soon becoming rancid and unmerchantable. So long as the quantity of the present quality of butter produced in Denmark is sufficient to supply the increasing demand, it will not be possible for American dealers to extend their trade in this direction with an inferior article.

V. V. SMITH,
Consul.

UNITED STATES CONSULATE,
Saint Thomas, January 8, 1884.
H. Ex. 51—41

Head.	Value.
145	\$2,150
1,727	11,725
1,374	35,010
20	255
86	1,165
3	40
3,355	50,375

AUSTRALASIA.

THE CATTLE OF NEW ZEALAND.

REPORT BY CONSUL GRIFFIN, OF AUCKLAND.

In replying to the "cattle" circular of July 18th, 1883, I have the honor to return herewith the forms (inclosure No. 1) transmitted to me in November last, and which I have filled up with such information as was possible for me to obtain concerning the cattle in the provincial district of Auckland. I have further the honor to state that the steady annual increase in the exports of New Zealand frozen meat and dairy produce, together with the favorable condition of the country, it being well grassed and watered, have done much to improve the condition of cattle in this colony.

PASTURE LANDS.

Every year new lands are being fenced in and sown with English grasses. The total number of acres in grass in New Zealand in 1883, including land in hay after having been broken up, was 2,018,964 against 1,771,875 for 1882, an increase of 247,189. If, however, the land in oats, barley, and wheat were added, the number of acres in green crops for 1883 would amount to nearly 4,500,000. The value of grass and clover seeds imported annually into the colony is something over \$500,000.

Considerable quantities of grass seed, principally timothy and clover, come direct from the United States, and also small quantities of the variety called *alfalfa*. Both the volcanic and light sandy soil of this colony produce rich, succulent grasses, well adapted for fattening cattle without any extra food. Second-rate pastures will generally yield a better profit for the dairy, together with the breeding of cattle and rotation of crops in connection with grazing. The greater portion of second-class pastures require breaking up after grazing from three to four years. Dry, billy land, and what may be termed as third class, is better adapted for sheep.

NUMBER OF SHEEP AND CATTLE IN NEW ZEALAND.

The sheep industry is by far the most important one in the colony; but I have observed that the increase in the number of sheep during the last decade has not anything like as great pro rata as that of cattle.

The number of sheep in New Zealand in 1884 is estimated at 13,113,412. In 1874 it was 11,704,883, an increase of only 1,408,567. In 1874 the number of cattle in New Zealand was 494,917, and now it is about 1,000,000. The census for cattle is taken in New Zealand every three years. The last census occurred in 1881. It will be taken again in April next, and until then the number of cattle in New Zealand for 1884

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can only be given approximately. The subjoined table shows the number of cattle in New Zealand at each census since 1858:

Year.	Number.	Year.	Number.
1858.....	137, 204	1871.....	436, 592
1861.....	193, 285	1874.....	494, 917
1864.....	249, 760	1878.....	578, 430
1867.....	312, 835	1881.....	698, 917

At the last census Auckland district had 158,181 cattle; Taranaki, 51,846; Wellington, 140,951; Hawkes Bay, 36,213; Marlborough, 9,019; Nelson, 31,620; Westland, 7,944; Canterbury, 115,155; Otago, 150,150; Southland, 34,205, and Chatham Island 6,883. About 40 per cent. of these cattle consist of Shorthorns and kindred breeds, and the remainder of Herefords, Devons, Ayreshires, Normans, Jerseys, and mixed breeds, &c.

While New Zealand has produced a higher class of cattle than any of the other Australasian colonies, she is only the fourth in the list in regard to the number of head. Taking the census of 1881 as a guide, Queensland had 4,089,715; New South Wales, 1,859,985; Victoria, 1,207,088; New Zealand, 698,917; South Australia, 306,046; Tasmania, 122,504; Western Australia, 65,473. Total Australasia, 8,429,448.

With the exception of New Zealand, cattle in the Australasian colonies, in spite of everything said to the contrary, do not thrive as well as in the great cattle districts of the United States, and in regard to numbers Texas alone has more than half as many cattle as the Australasian colonies put together.

CATTLE QUARANTINE REGULATIONS.

All the Australasian colonies except New Zealand had for many years prohibitory laws against the importation of cattle. New Zealand, on the contrary, admitted cattle not only from Australia but from Europe and America. Last year, however, the government of the colony issued an order in council prohibiting the importation of live stock from the United States. This order is now very generally admitted to be a mistake. Mr. Robert J. Creighton, the agent of the New Zealand government at San Francisco, has repeatedly pointed out that there is no cattle disease such as rinderpest and foot-and-mouth disease on the Pacific coast. He has also shown that the Texas fever, which cattle-breeders fear so much, has for many years been localized. The old plan of driving cattle long distances, and which was the principal cause of the outbreak of the disease, has been abandoned on account of the facilities afforded for transportation by railway in Texas, New Mexico, and Colorado. The liability to the outbreak of this disease is now reduced to a minimum; moreover, none of these cattle have access to the blooded herd or dairy stock of the country.

The question of quarantine is one in which the authorities on cat diseases differ widely. The quarantine regulations in nearly all countries are so loosely enforced as to be practically worthless, and always occasion a vast amount of trouble and expense. Besides, many diseases of animals, like those of human beings, are localized. For instance, certain diseases in tropical countries are unknown in cold climates, and

tropical countries are wholly free from many diseases of frigid zones, and any attempt to regulate them by quarantine would be useless. When a country happens to be free from a certain disease, even if it should be a disease that cannot be imported, many are inclined to attribute its absence to the existing quarantine regulations.

Now it is well known that there has never been a case of hydrophobia in any one of the Australasian colonies, yet thousands of dogs have been imported from countries where this awful disease is prevalent. If there had been a law against such importations we should doubtless find many persons ready to proclaim that the freedom of the colonies from this disease was due solely to the prohibition.

It is said that the law forbidding the importation of cattle into New Zealand was passed mainly for the benefit of speculators. The prohibition will, of course, enhance temporarily the price of cattle, but in the end will prove very injurious to the cattle industry of the colony. Should there be no further importation of thoroughbreds into New Zealand, in a few years the cattle will not only cease to improve but will vastly deteriorate. The prohibition does not apply to Australia, yet the only cattle disease ever found in the colony was originally brought from Australia.

Some time ago the United States Government appointed a committee of inquiry into the dangers which would arise to that country from the introduction of neat cattle from Europe for the improvement of native breeds, and the committee reported that the introduction of neat cattle did not tend to the spread of contagious or infectious diseases. The operation of the sections of the United States law prohibiting the introduction of neat cattle was therefore suspended, upon the condition that the importers and owners should submit to such orders as the Secretary of the Treasury should from time to time prescribe.

When cattle are quarantined in the United States the arrangements for their reception at the various Government cattle stations are so perfected as to occasion the least possible trouble and expense to the importers. The New Zealand government might well imitate the example of the United States, for there is no infectious cattle disease in the United States that quarantine would not effectually guard against.

In this connection it is well enough to mention that when the British Parliament adopted a resolution prohibiting the importation of cattle from countries where the foot-and-mouth disease prevailed, charges were made in Parliament that such diseases existed in the United States. There appeared to be no other foundation for these charges than the fact that cattle suffering from these diseases had been landed in the United States direct from Great Britain, and that all such cattle had been separated in the most thorough and complete manner from the American herds. The United States Treasury Cattle Commission reported from Boston, Mass., July 21, 1883, as follows:

Beginning with the great rendezvous of cattle at Kansas City, Council Bluffs, and Omaha we have made careful investigations along all the lines of cattle traffic as far as the Eastern seaboard. In this investigation we have included all the great stock-yards where cattle are detained for feeding, watering, sale, &c.; all the great feeding-stables connected with distilleries, and starch, glucose, and other factories; all the city dairies where stock-yards exist and where the herds are replenished from such stock-yards, and to a large extent the great dairying districts into which cows are drawn from the above-named stock-yards and lines of travel. Up to the present date we have made observations in the stock-yards at the seaboard—the terminal end of our cattle traffic and that to which all infection must gravitate—but apart from the imported cases from Great Britain we have been unable to find a single case of the foot-and-mouth disease complained of.

NEW ZEALAND CATTLE IN THE UNITED STATES.

The high class of cattle in this colony and the low price at which they can be obtained has very naturally attracted the attention of the cattle-breeders in the United States. In August, 1883, Mr. A. W. Sisson, of California, dispatched Mr. Rollin P. Saxe, a cattle expert, to New Zealand to purchase for him a band of pure-blooded Herefords. Mr. Saxe arrived in Auckland in September, 1883, and after visiting several of the cattle districts in the colony purchased 20 two-year-old heifers in calf and 24 bulls from one to two years old from the New Zealand Stock and Pedigree Company, of Auckland. Mr. Saxe was not only surprised at the superb condition of the company's cattle but at the low prices at which they were sold. They were shipped to San Francisco by the Pacific Mail steamer City of Sydney in October last, being the first shipment of New Zealand bred cattle ever made to the United States.

Mr. Saxe is of the opinion that Hereford cattle can be more easily and economically brought to California from New Zealand than across the continent by railway from Illinois and other States celebrated for this particular breed. In Illinois these cattle sell at from \$500 to \$5,000 per head, whereas they can be bought in New Zealand at from \$100 to \$700 per head. Arrangements, it is said, have been made for monthly shipments of Herefords from Auckland to California, and Mr. Craig, of San Francisco, has proposed to establish a distributing farm for them on the Contra Costa Slope near Oakland. It is noteworthy that the two breeds of cattle most largely in demand in the United States, viz, the Jersey and the Hereford, thrive better in New Zealand than any other kind of cattle. The Jerseys are nothing like as numerous as the Herefords, from the fact that they were introduced at a much later period, but it is well known that they do equally as well. My attention has recently been called by stock farmers, to the high prices which these breeds bring in America. At the Kellog combination sale in New York last June a yearling bull, King Ashantee, brought \$5,600; a six-year-old cow brought \$1,900, and a two-year-old heifer brought \$1,650, and many others at similar figures. These prices, however, were eclipsed at a subsequent period at Mr. T. S. Cooper's sale in Connecticut. At Mr. Cooper's sale 119 Jerseys averaged \$952.50 each, and a thirty-three months' old heifer brought \$5,150, and a five-year-old cow brought \$2,800.

NEW ZEALAND HEREFORDS.

The New Zealand Stock and Pedigree Company, of Auckland, has one of the largest herds of pure-bred Herefords in the world. This breed has long been a favorite one here. They are tough, hardy, and are able to pick their food on poor soil, and when two and three years old outweigh any other breed, and are famous for their high-priced meat; that is to say, their loins are well developed, and their yield of succulent and porter-house and sirloin are proportionately heavy. The hind quarters of the pure-bred Hereford are long from the hip backwards. The thighs are large and full and well meaty at the hocks. The whole carcass is set square on good, short legs standing well apart. The flesh is firm and the hide mellow, with soft, hair, not too fine, but giving the impression that it can be stretched to any extent.

The color of this breed is a distinct red, with white face, mane, and white breast and legs as far as the knee. As an evidence of how they stand hard feed it is said that during the long drought of 1878 and

1879, in Australia, about 5 per cent. of the Herefords were lost on a run in Queensland, against 10 per cent. of the Shorthorn herd and 20 per cent. of the stud Shorthorn. In one large paddock there were seventy Shorthorn and seventy Hereford bulls one and two years old. The Shorthorns got so poor that they had to be turned out on the run, the paddocks being bare of grass, but the Herefords kept in good, strong condition.

When Captain Cook first visited New Zealand there were no cattle in the country, but at a subsequent period some were introduced from Australia. In the early settlement of the colony the length of time occupied in a voyage from England, and the many difficulties which had to be overcome by the pioneers, prevented any special attention being given to the improvement of the breed of cattle by importation, as that necessarily involved a heavy expenditure of money, not to say anything of the time and patience required to introduce them; but at last the colonists began to improve their herds by the introduction of thoroughbreds from Europe, and I have not the slightest hesitation in saying that nearly all the imported cattle thrive better in New Zealand than in their native homes, and that this superiority is developed to a still higher degree in their offspring.

NEW ZEALAND SHORTHORNS.

The Shorthorns, as I have stated previously, outnumber those of any other breed in New Zealand. They were amongst the first pure-blooded cattle imported into the colony, and have ever since been very popular on account of the prevailing impression that they are the best suited for improving the breed of inferior cattle and for adapting themselves to different kinds of soil and climate. Those who keep up the pure strain prefer the roan color to any other, though in large herds red and white are not uncommon. Any sign of black is regarded as an impurity of blood and is not bred from, but are drafted off to the butcher. The cows of this breed are believed to give milk for a longer period than any other and, when dry, fatten rapidly.

The largest prices ever paid for New Zealand cattle have been paid for Shorthorns. Messrs. R. and E. Maclean, of Auckland district, for many years gave great attention to this breed.

The famous bulls Duke of Newcastle and Duke of Cambridge, now the property of the New Zealand Stock and Pedigree Company, were bred by the Messrs. Maclean. These bulls took the first prizes at the Auckland agricultural shows, and attracted so much attention amongst judges of stock that they were sent to Sydney in 1878. At that time they were said to be the finest specimens of cattle ever seen in New South Wales. The Duke of Cambridge, dam Lady Eleanor, a prize-taker at the West of England shows at Taunton and Exeter, and his sire the 25th Baron Wetherby, came of the celebrated Siddington tribe of pure Bates, the property of Mr. Bowley. The Duke of Cambridge is of a light-roan color, and at four years of age was very massive, with great thickness through and of immense depth, with capital underline, good spring of the rib, and level back. His companion, the Duke of New Castle, a rich roan, was calved in November, 1875, got by Ninth Colonel Tregunter, dam Countess of Taunton by Duke of Somerset (26012), grand dam Windsor, 1st by Red Windsor (24926), 3d of Crocus by Henry 1st (26370), 4th dam Cowslip by Saladin. This is a pure Bates pedigree of great excellence. His sire, 9th Colonel Tregunter, was out of a Siddington cow, Dutchess 94th, and has an un-

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broken line of thirteen Dutchesses in his pedigree. The Duke of New Castle is of a beautiful roan color, has a fine head and well-shaped neck.

Each of these bulls took first prizes in their respective classes at the cattle show at Sydney, one being for three years and over and the other for two years and under three. In addition to this the Duke of New Castle was awarded the first and champion prize for the best bull of any breed, for which the whole of the Australasian colonies competed, and it is said that the owners refused for him an offer of 2,000 guineas (\$10,000).

NEW ZEALAND POLLED CATTLE.

The steady demand for black Polled Aberdeen Angus cattle in the United States has increased the price of this breed fully 50 per cent. in Scotland.

The Polled Angus being natives of a cold climate are, of course, of a hardy breed, and on that account are well adapted to the severe winters of America, and, moreover, it is said they require no artificial feeding. In the climate of North New Zealand, where they do not require housing, it is thought they will do even better than in colder countries. Although as yet this breed is confined principally to the colder latitudes in the south island, it is thought they will soon be distributed throughout the colony. I learn from a late number of the North British Agriculturist that Mr. W. S. Davidson was fortunate enough while in Scotland to secure for New Zealand the celebrated Pride heifer and a pair of yearling bulls of the Aberdeen Angus variety.

Mr. Davidson also purchased for New Zealand, Solomon (2,349 pounds), of the celebrated Sybil family and winner of the third prize at the last Inverness show. The animal was bred by the Earl of Southesk, and is the produce of the first prize national societies' animals, Sybil 2nd, of Tillyfour (3526) and Knight of the Shire (1699). The cost, like that of both parents, was considerable. Mr. Davidson also bought from Mr. George S. Grant, Achorachan, Glenlivet, at a high price, the yearling son of the prize cow Patience of Corskie (1932), bred at Drumin, and of select pedigree. The sire of the yearling was the Erica Pride bull Proud Viscount (1246). The Sybil bull is a son of a member of the late Mr. McCombie's Paris group, while the Patience yearling is half brother to the celebrated heifer Pavilion (3772) which, exhibited by the Earl of Air-lie, carried everything before her at the national shows. Recently some New Zealand bred Polled cattle have been exported to Australia. Two of these were shipped to Queensland ; one of these, a yearling heifer from Mr. Auld's cow Pride of Aberdeen, brought the sum of 510 guineas (\$2,550), and the cow Pride of Aberdeen brought 385 guineas (\$1,925). These cattle were the property of the New Zealand Land Company, and were entirely grass-fed on the company's estate near Omaru.

NEW ZEALAND DEVONS.

The Devons, next to the Shorthorns and Herefords, are the most numerous in New Zealand, and in time will become fully as popular. Mr. James Dilworth, who was formerly president of the New Zealand Agricultural and Pastoral Association, says that the Devons are an excellent breed and thrive remarkably well in the Auckland district. He says that some cattle experts think them superior to the Shorthorns, but, owing to the fact that little knowledge prevails in regard to them, they have not obtained the rank they deserve. They are smaller than the

Herefords, are of a dark-red color, white nose, full eye, and fine horns. Mr. Thomas Allen, to whom I am indebted for much of the material in this report, is of the opinion that the Devonshire oxen are unrivaled at the plow, especially if the ground is not too heavy. They have a quickness of action which no other breed of cattle can equal.

Ox labor is no longer employed in England, but Mr. Allen thinks that years will elapse before such labor can be dispensed with in New Zealand. He says that no better breed can be found for the purpose than the Devon. They have better dairy qualities than the Herefords, but do not grow or fatten so rapidly on rough feed. They are, however, profitable to the butcher and prove to be better than they look.

AYRSHIRES.

Ayrshires are also a favorite breed here. They come next to the Devons in regard to numbers, and are especially adapted for the dairy. They give a great quantity of milk and for a long period. They are found in New Zealand of various colors, principally red and white and sometimes brown and white.

The Ayrshire steers, unlike the Herefords, do not make good beef, and are usually sold for veal and the heifers reared for the dairy. Mr. Dilworth owns a pure-blooded heifer of this breed that at one time produced as much as 23 pounds of butter per week, and now averages from 12 to 15 pounds per week.

ALDERNEYS.

The Alderneys are not numerous in New Zealand, and are looked upon as fancy cattle rather than profitable ones. They are kept here for the richness and quality of their milk, but are not used in large dairies. They are of little value to the grazier.

MIXED BREEDS.

In addition to the distinct breeds I have described there are a great number of cross-bred cattle in New Zealand, from the Longhorn down to the colonial bred Polled cattle. During the spring and summer months thousands of cattle are fattened and slaughtered from the ordinary pastures without the aid of either roots or artificial food. In some parts of the colony cattle are fattened on the open pastures all through the year. In districts subject to frost, it is necessary to grow a good supply of roots and hay on which to fatten the cattle during the winter. Stall feeding or even housing the cattle during the winter nights is quite the exception here. Some pure-bred cattle kept for stud purposes are stall fed, and on some dairy farms the cows in milk are housed at night during the three winter months, when they are fed on hay and roots, grazing the paddocks during the day, but the greater number are left out all the year round without shade or shelter. On some of the large runs herds of breeding cows are kept, and the calves are left to run with their mothers till they are four or five months old, when they are drafted off to a distant part of the run and weaned out of sight and sound of each other. The young stock thus bred are reared and some times fattened. If the feed is not good enough they are sold to the graziers to fatten, the difference between the value of store and fat cattle being the grazier's profit.

PRICE OF NEW ZEALAND CATTLE.

Three-year-old steers are worth in Auckland from \$20 to \$30 each, and when fat they realize from \$35 to \$55, the market being a very fluctuating one. The cattle are sold at per head, the calculation being a guess one of per 100 pounds dead. The auctioneer's quotations vary from \$4.25 to \$7.50 per 100 pounds of beef, the price depending on the supply, but the former is often the midsummer price and the latter the midwinter or early spring.

DAIRY FARMING IN NEW ZEALAND.

Dairy farming is carried on with profit in New Zealand by a large proportion of the settlers, especially when the family can do the work, without employing much extra help. Near the large towns and cities considerable quantities of milk are consumed fresh, some farmers retailing their own milk, while others sell wholesale to the dairy companies or dealers, who sometimes receive it by railway from 10 to 30 miles. The dealers generally pay from 10 to 16 cents per gallon for the milk. The business of butter and cheese making, combined with rearing calves and pigs, is profitably followed when the distance from the city or railway will not allow the milk to be sold fresh. Several cheese factories are now in full working order in the colony, the machinery for which was imported from the United States. The farmers supply the milk from a radius of 3 to 5 miles to these factories at from 7 to 8 cents per gallon, and find it more profitable than butter-making.

NUMBER OF DISTINCT BREEDS IN NEW ZEALAND.

There are quite as many different kinds of cattle in New Zealand as in the United States. Mr. Dilworth says ten distinct breeds are known to exist in the colony, and there may be some others (recent importations) in the south island that have not as yet come under his knowledge. The following are the names of the different breeds of cattle in New Zealand: Shorthorns or Durhams, Herefords, Ayrshires, Devons, Black Polled Angus, Jerseys, Alderneys, Normans, and Bretons. The Shorthorns and the Herefords are the two principal breeds. The New Zealand Stock and Pedigree Company own a herd of the latter, pure blood, numbering over seven hundred.

One of the most striking facts in connection with the cattle industry of this colony is their wonderful immunity from diseases which cause such devastation in Australia. For instance, pleuro-pneumonia cannot live in New Zealand. This dreadful disease was introduced here on two occasions from Australia, but at once assumed a very mild type, and soon disappeared altogether. Another fact almost as interesting is that cattle are never vicious in New Zealand. It is well known in Auckland district that cattle will not fight one another. I have often observed that when bulls of an equal age are turned into a paddock together for the first time, they will not take notice of each other. I have also observed that in large dairies where fresh cows are repeatedly introduced it is never necessary to cut or cap their horns.

COST OF TRANSPORTATION.

The cost for shipping cattle per head to San Francisco via the Pacific Mail Steamship Company is \$150 to \$200. This cost would be materially lessened if they were shipped in sufficient numbers to justify

the company in making arrangements for regular shipments. The cost of transportation from London to Auckland via the steamers of the New Zealand Shipping Company and the Shaw, Saville, and Albion & Co. is from \$200 to \$250 per head. The expense of feeding aboard ship, both on the San Francisco steamers and the direct steamers to London, is about 2 shillings (48 cents) per day. The food consists of 25 pounds of oaten hay, 25 pounds of oaten chaff, and a little bran.

The cost of transporting cattle from London to New Zealand has been materially reduced since the establishment of a direct steamship service with this colony, and I am informed that after the 1st of March next the charges for transporting all kinds of live stock via the New Zealand Shipping Company will be fully 25 per cent. less than the present rates.

G. W. GRIFFIN,
Consul.

UNITED STATES CONSULATE,
Auckland, N. Z., February 4, 1884.

CATTLE STATISTICS OF NEW ZEALAND.

The Shorthorn cattle give an annual average of 4,380 pounds of milk. In this climate they will milk nearly the year round. Ten pounds of milk produce 1 pound of cheese. Their live weight is, cow, 1,300 pounds; bull, 2,000 pounds; ox, 1,400 pounds. They arrive at maturity at four years. The average weight of meat at maturity is 800 pounds. The cows are red, roan, and white; red and roans being preferred. The pure breeds come from English stock, and are descended from cattle imported from Holland during the last century by English breeders.

The cattle are not housed in this country. They are mostly grass fed, with, in winter, two feeds per day of oaten hay, turnips, or clover hay. The products are handled mostly through storekeepers and commission merchants. This is caused by there being no dairy farming on a large scale.

The mean temperature of Auckland is 59.3; in winter, 65.4. Alluvial, loam, clay, and sandy soils are found in New Zealand scattered over large areas, and even in the district of Auckland. Timothy is not much cultivated, but clover (principally red and white) is largely cultivated. Rye grasses, perennial Italian and English.

CATTLE IN TASMANIA.

REPORT BY CONSUL WEBSTER, OF HOBART.

With reference to cattle circular of 18th July and accompanying memoranda, I have the honor to say with regret that, after consulting the government inspector of stock, I find that no records are kept which would enable me to supply you with reliable information.

Comparatively little attention has been paid here to cattle breeding. The total number of cattle in the island is 122,500 only.

A. G. WEBSTER,
Consul.

CONSULATE OF THE UNITED STATES,
Hobart, November 28, 1883.

CATTLE IN VICTORIA.

REPORT BY CONSUL-GENERAL SPENCER.

Referring to circular letter of July 18, 1883, relative to stock breeding and dairy products in this colony, I herewith transmit all the information I have been able to obtain on the subject, which is, I regret to say, very meager and unsatisfactory.

On the receipt of the circular I placed myself in communication with the secretary of agriculture for this colony, requesting him to furnish me, so far as practicable, with the desired information.

On the receipt of his reply, in view of the disappointing character of the information thus obtained, I addressed a circular letter to the leading cattle-breeders and dairymen of this colony, but with only indifferent success.

As the result of my inquiries and observations, I am led to believe that the United States has little or nothing to learn in respect to cattle breeding and dairy farming from Australia, where both these industries may be regarded as still in their experimental stage.

With a boundless pasturage and a most propitious climate, rendering housing or hand-feeding unnecessary, all the year round, there has hitherto been no necessity for conducting these and similar industries on strictly scientific principles; hence I account for the unsatisfactory character of the information obtained.

O. M. SPENCER,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
Melbourne, May 16, 1884.

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GRIFFIN,
Consul.

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CATTLE IN SYRIA.

REPORT BY CONSUL ROBESON, OF BEIRUT.

In compliance with Department circular dated July 18, 1883, desiring information relative to breeding cattle, which will be of use to stock-raisers in the United States, I have now the honor to submit my report on the breeding, raising, &c., of cattle in this part of Turkey.

BREEDS OF CATTLE IN SYRIA.

It will be seen from the accompanying table that there are three breeds of cattle in Syria: Joulany (of Bashan); Belady (native or common); Haysy (of Damascus).

The Joulany breed are black in color, and are supposed to have been originally brought from Bashan, in the eastern country beyond the Jordan. They are well formed and hardy, and the meat is sweet and tender. (The natives of this country use but little if any beef.) The gross average weight of the Joulany at three years old may be put down as follows: The bull and ox from 500 to 600 pounds; the cow from 450 to 500 pounds. The Belady differs very little from the Joulany in weight or form. In color they are, as a rule, dark-brown, but vary.

Both of the above-named breeds are used for plowing, in fact all the plowing in Syria is done by cattle—neither horses, mules, nor camels being used for the cultivation of the soil.

The Haysy breed (Damascene) are reddish-brown in color, slightly larger than either the Joulany or the Belady, and are considered the best breed for milk and butter. There is very little attention given, however, to the breeding and raising of cattle in Syria.

BREEDING AND RAISING SYRIAN CATTLE.

The natives generally breed from bulls before they are two years of age, instead of mature animals; nor do they give any special attention to feeding or housing; they have no barns or sheds for housing cattle or other stock. The cattle are generally kept in the yard of the owner when not grazing in the commons or plowing. The grazing is rather poor in most parts of the country, but in the Hauran and the plains of Damascus, the pastures are good for six or seven months in the year. (From May till October we have no rain, consequently, where the land is not irrigated, the vegetation dries up.) In the Lebanon Mountain the cattle are generally left to graze on the hills during the summer season; the grazing being very poor they become very thin. In autumn mulberry and grape-vine leaves are gathered and given for food to cattle, while during the winter they are fed with wheat straw, cut fine, and the dry residue of the mulberry leaves left by the silk-worms. In some parts of the Bekaaah plains the peasants raise buffalo, which give abundant supplies of rich milk; but these animals are not good for beef. The peasants who raise the most if not all of the cattle in this

country do not allow the calves to suckle more than a few days after they have been dropped; when seven or eight days old they are taken from the cows and are fed on grass and other food. This system injures the calves very much, and they soon become thin and weak. The Arabs, however, think that taking the milk that nature intended for the calf and selling it is a clear gain.

MEAT, MILK, AND CHEESE IN SYRIA.

The best breeds for beef are the two first, viz, the Joulany and Belady. The Damascene are considered the best for milk and butter, but are harder to keep, taking twice as much food as either of the other breeds. It is difficult to get any statistics of the quantity of butter or cheese manufactured in the country. Butter is sold fresh as soon as taken from the milk; none is kept in stock or prepared for exportation. The quantity of cheese made is so small that the manufacture of cheese cannot be considered an industry in Syria.

There is no way of finding out the number of cattle in my consular district, nor the percentage of the several breeds or the percentage bred for the dairy and beef, nor the increase or decrease of stock. The cattle seem to be sufficient for all the demands, as none are imported.

The best bulls can be purchased at a price varying from \$75 to \$100; cows from \$70 to \$90.

EXPORT OF SYRIAN CATTLE TO THE UNITED STATES.

The best method for exporting cattle to the United States from Syria is by one of the English lines of steamers plying between Beirut and Liverpool, there to be reshipped.

The cost per head for cattle, from the best information I can get, will be \$75 to \$80, including food, &c.; for a number better rates might be obtained.

I have seen fine cattle about Damascus, and I am of the opinion that with careful breeding and proper raising Syrian cattle are worthy of the attention of American stock-raisers and farmers.

SHEEP.

I think that the flat-tailed sheep of Syria are well adapted to many parts of the United States, especially the Southwestern States and Territories. They make good mutton, are hardy, and grow to a large size. Their fleeces are fine, weighing from 12 to 15 pounds each. The wool is of the best quality for making carpets and other heavy woolen goods. The average price of sheep is \$5 per head. The cost of exportation to the United States via Liverpool would be about \$30 per head, including food.

PROHIBITED.*

I beg to remind all who may be interested in the exportation of horses, mules, donkeys, cattle, and sheep from Turkey that the same is prohibited by the laws of the Ottoman Empire.

JOHN T. ROBESON,

Consul.

UNITED STATES CONSULATE,

Beirut, March 30, 1884.

* In his report upon the "Angora goat," published in No. 31, for July, 1883, Consul-General Heap thus refers to the prohibition of the export of live animals:

"After the last shipment of goats to the Cape in 1880, the Turkish Government prohibited the export of Angora goats. This was done in response to a petition on the

CATTLE AND DAIRY FARMING.

Special statistics concerning cattle in Syria.

Name of breed.	Name of country.	Daily average pounds of milk.		Pounds of milk required to 1 pound of butter.		Pounds of milk required to 1 pound of cheese.		Size at maturity (feet).				Live weight.		Age at maturity.	Average weight of meat at maturity.	Description.
								Cow.		Bull and ox.		Cow.	Ox.			
								Height.	Length.	Height.	Length.					
Joulany ...	Basham	11	17	6	4	6½	4½	6½	Lbs. 559	Lbs. 579	Yrs. 3	440	Black; great power of endurance.			
Belady.....	Coast and interior.	10	17	6	4	6	4½	6½	540	566	3	430	Dark brown; compact and well knit.			
Hayay.....	Mount Lebanon and the district of Damascus.	16	17	6	4	6½	5½	7	630	670	3	511	Reddish brown; tall and slender legs.			

There are no barns or sheds for housing cattle, &c. They are generally kept in the yard of the owner. In spring and summer they are let out to graze. In autumn fresh mulberry and vine leaves are given them for food. During winter they are fed with wheat straw, &c.

Topography and climate of Syria.

Districts.	Altitude.	Mean temperature.	Summer.	Winter.	Soil.			
					Alluvial.	Loam.	Clay.	Sandy, &c.
Joulany.....	2,000	°F. 70	75	55	.....	In part (and rocky).	.....	.....
Belady*.....	.....	75	85	65	.....	In part	.....	.....
Hayay	2,500	65	80	60	Alluvial.	.....	.....	Mostly.

*Mostly on sea-coast.

subject sent in by the native dealers in mohair, who became alarmed at the rapid development of the industry at the Cape, which they supposed was the cause of the depreciation in the value of mohair. The true cause of the depreciation has been mentioned under the heading of 'Export and price of mohair.'

"This prohibition had nominally been in force for many years, and was in reality only renewed in 1880, but, like all other governmental edicts in this country, it can be overcome and need not stand in the way of intending importers. Some small outlay may have to be made to obtain a permit for exportation. Shortly after the prohibition the writer had a permit of exportation offered to him for 2,000 goats. The safest way, however, would be to apply for a permit through the minister of the United States, who would no doubt obtain it."

CEYLON.

CATTLE OF CEYLON.

REPORT BY CONSUL MORREY.

DIFFICULTIES WHICH BESET CATTLE-BREEDING IN CEYLON.

The materials for a report upon the cattle of Ceylon are very meager. The climate of the low country is too humid and the pasturage too poor for the vigorous support of the large animals sometimes imported from Europe, Australia, and the hill districts of India, nor can they be said to thrive greatly in the more elevated region, for even there the natural grasses are neither nutritious nor wholesome, and if these species of cattle are not largely fed on grain or roots they fall off in condition and die early, having in the meantime produced a degenerate progeny.

I have it on the authority of a European lady, who has a taste for the breeding of improved cattle, and who has expended large sums of money and much time and attention in that direction, that her early efforts in Nuwar Eliya, which is the sanitarium of Ceylon and over 6,000 feet above sea-level, were very disappointing, in consequence of her best animals often dying of intestinal complaints. Post-mortems finally disclosed the fact that much of the grass they had consumed was so hard and wiry that it had resisted digestion and remained in the animal in the form of large fibrous balls, which completely stopped intestinal operations and caused death.

The plan finally adopted by this persevering lady to preserve alive such of her surplus stock, principally cows out of milk and youngsters, as it was impracticable to keep stall-fed, was to send them down to Pussellawa, to a coffee estate about 3,000 feet above sea-level, where they were fed on cultivated grass, for the sake of their manure, and thus the stock was for a considerable time kept in fairly good condition. Eventually, however, the said coffee estate went under different management, when, owing either to a neglect about cultivating the grass or to not feeding it to the cattle, those poor brutes were, to my knowledge, soon reduced to a most pitiable state of starvation, from which it proved impossible to recover them, and the moiety if not the whole of that choice herd is now extinct.

Most other people's attempts at rearing improved stock here have resulted about the same, and, although there are in the central province, where most of these operations were carried on, some very nice stock of mixed parentage, still it has been reared at a cost far beyond its value, and if not kept up by fresh importations of new blood from abroad, will probably degenerate and run out in the course of another decade. It also seems to be very difficult to improve the common Singhalese cattle by crossing them with foreigners (see Plate 1); for whatever the present improvement, principally in size, may be, such progeny are generally wanting in hardiness, and crosses likely to work an improvement in this respect are difficult of accomplishment. Some beautiful bulls of the Amrut Mahal (Milk Palace) breed, which I imported

Age at maturity.	Average weight of meat at maturity.	Description.
3	440	Black; great power of endurance.
3	450	Dark brown; compact and well knit.
3	511	Reddish brown; tall and slender legs.

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in a herd of Mysore cattle, in 1875, could not be enticed into intercourse with Singhalese cows, though intermixture does commonly occur between other varieties and the Singhalese breed.

SINGHALESE CATTLE.

The ordinary cattle of Ceylon are probably descended from breeds inhabiting the Telugu country of India, as they resemble very closely, in conformation and color, the cattle now common there; whereas there are great differences in these respects between them and the breeds of that portion of India lying nearly opposite this island, whence it might naturally be expected that such animals would have been introduced. It must be remembered, however, that the Indian conquerors of Ceylon and founders of the Singhalese race of people, came from the Telugu district, about 550 B. C., and subsequently kept up an active and constant communication with their fatherland, obtaining from there even their wives, priests, raiment, and very likely their domestic animals.

I therefore believe that the popularly termed Singhalese cattle are mainly the offspring of Telugu stock; and though somewhat degenerate in size, and now almost inconsequential for dairy purposes, are nevertheless better suited to this climate and for the ordinary needs of this insular people than any other variety at present known.

The largest of them do not exceed 4 feet in height, measured to the top of the hump, over the withers, nor weigh above 350 pounds alive. The females are about 6 inches lower, owing not only to ordinary reduced stature, but to an unproportionally small hump development, as compared to the males.

The maximum amount of milk yielded by a cow under favorable conditions is about 2 quarts per diem, exclusive of enough to support life in the calf. In the absence, by death or otherwise, of her offspring, the mother ceases to give milk altogether, so that in some cases where a calf has died its skin has been stuffed and presented to the mother at milking time, and thus, for a short period at least, through this deception, the animal would be induced to give down her secretions.

Under liberal treatment a very good cow, especially if she be a fond mother, will yield milk for nine months, but as a rule six months is about the milking term. If she depend upon grass altogether for sustenance her mess of milk will be reduced one-half, and the maximum amount is only obtained by feeding with some cotton seed and poonac (cocoanut-oil cake).

For draft purposes, the males are, for their size, wonderfully good, and capable of drawing comparatively enormous loads. Hitched in pairs to huge two-wheeled carts, they may be seen any day, in our seaport towns, struggling along with a load of twenty-one bags of rice, equivalent to 3,300 pounds weight; and yet they are mere pigmies, poorly fed and miserably housed, or more frequently not sheltered at all, but left tied in some open court and made to lie upon the bare ground or brick pavements.

Many of them, generally of smaller size, are kept by the natives to draw singly the family "bandy," a light two-wheeled vehicle, often seemingly hardly big enough for one person, and yet, by some remarkable method of close stowage, mutual forbearance, and mysterious adhesiveness of the occupants, made to contain four or five people, large and small; with which load the sturdy little bull trots away, at the rate of 6 or 7 miles an hour, and if the driver entertains a con-

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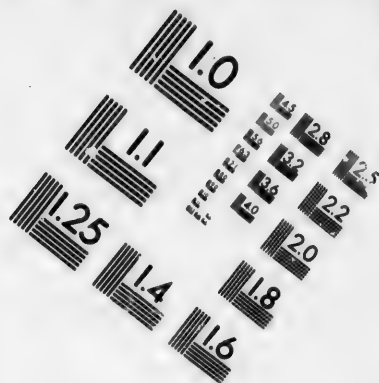
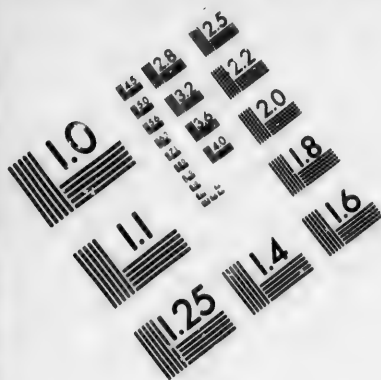
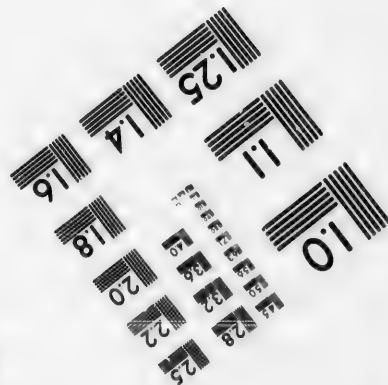
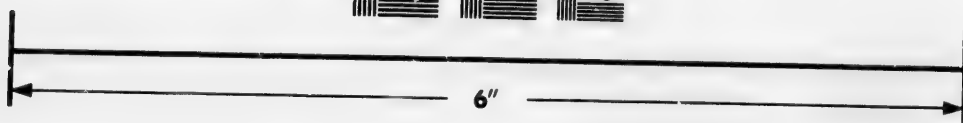
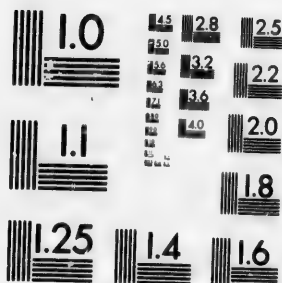


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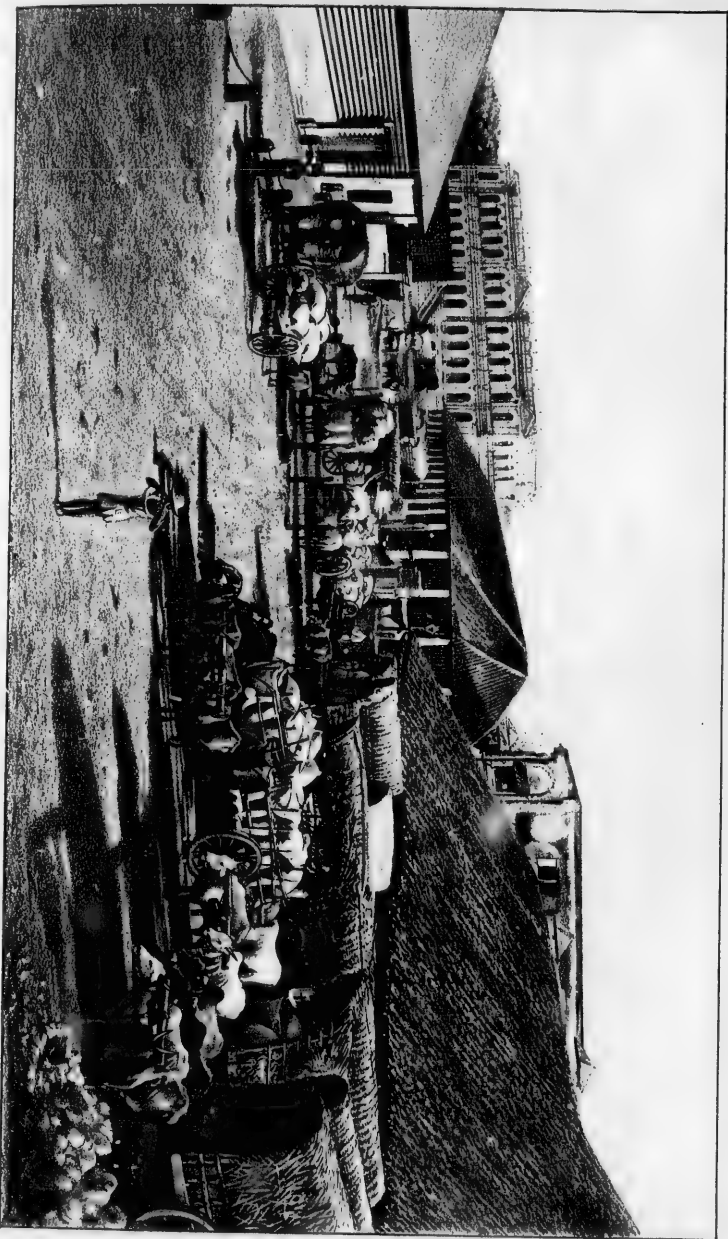
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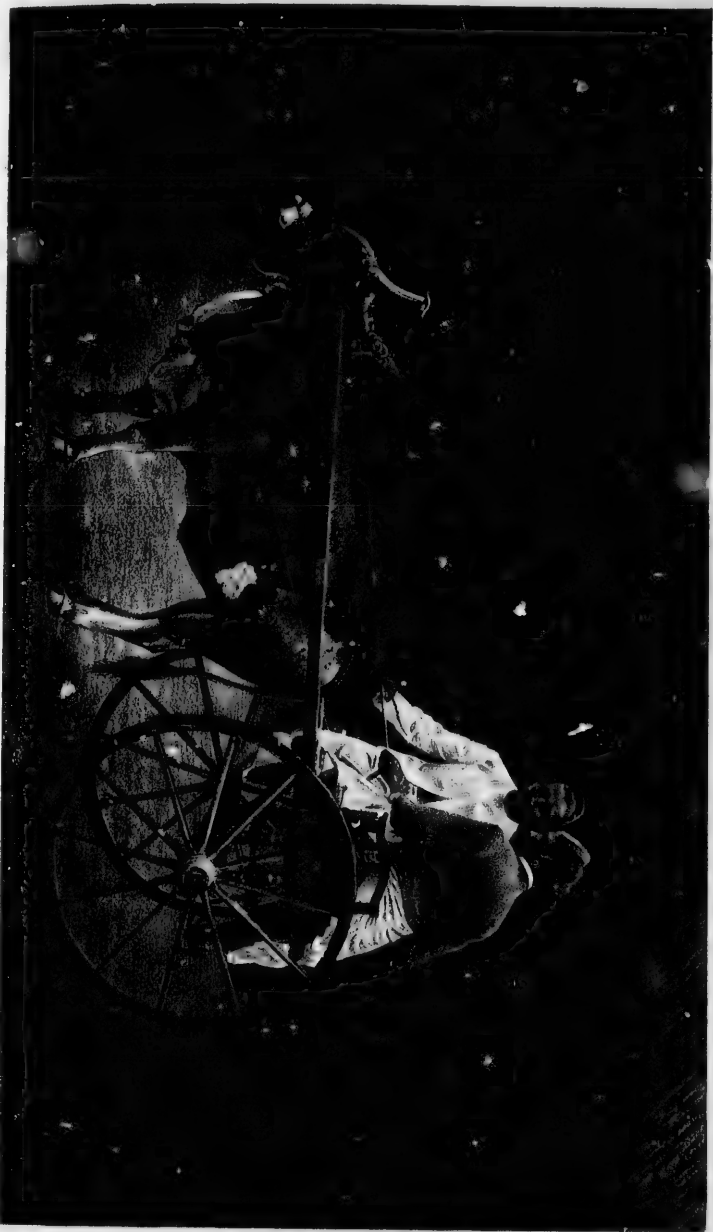
SINGHALESE DRAUGHT BULLOCKS COLOMBO, CEYLON

PLATE 100

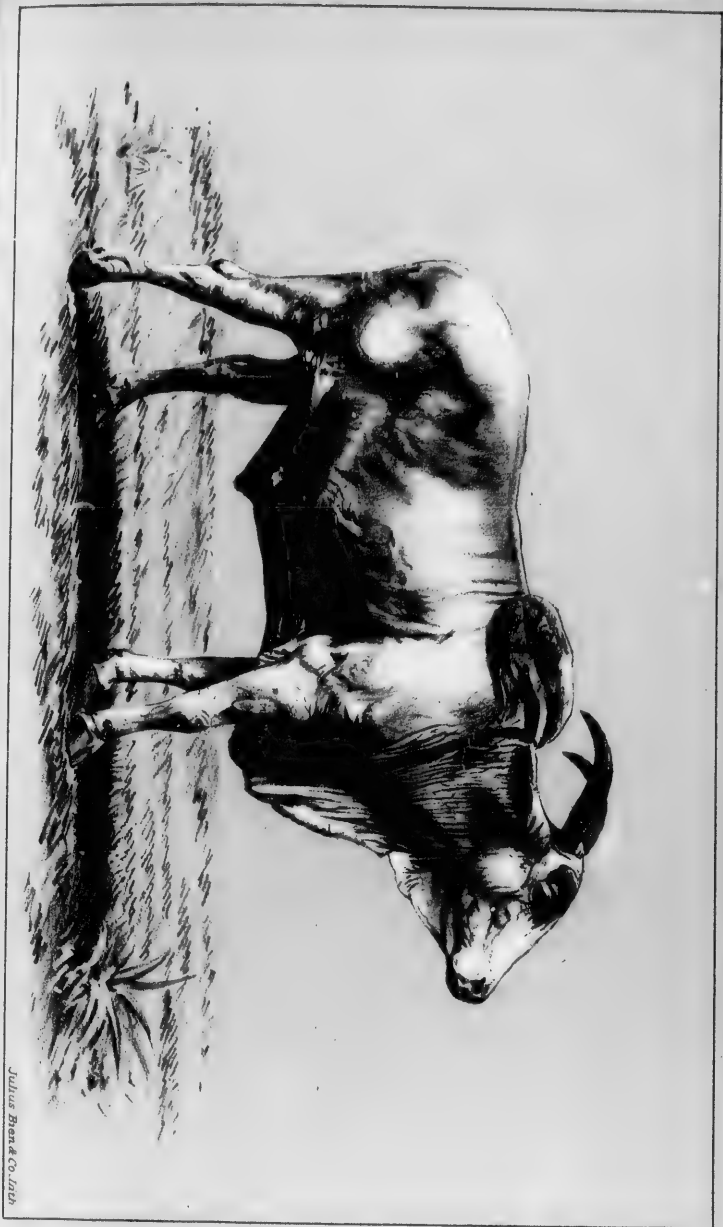


SINHALESE DRAUGHT BULLOCKS, COLOMBO, CEYLON

Life in Ceylon, Vol. I, p. 124

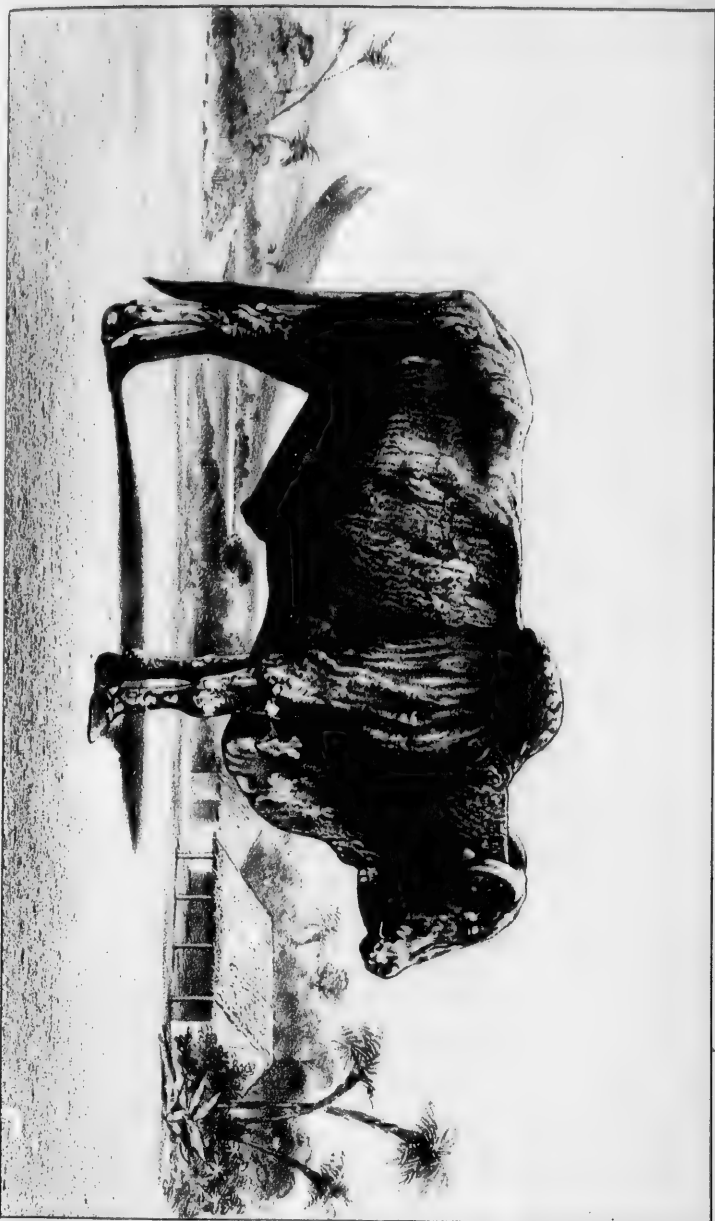


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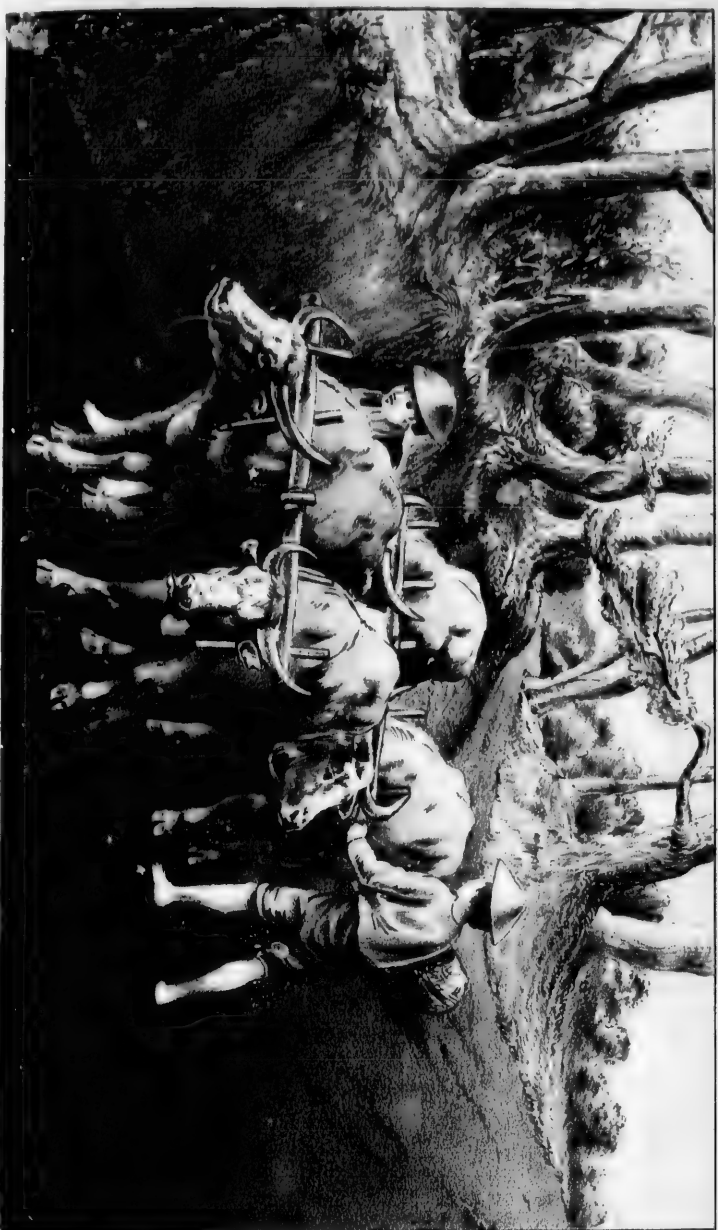
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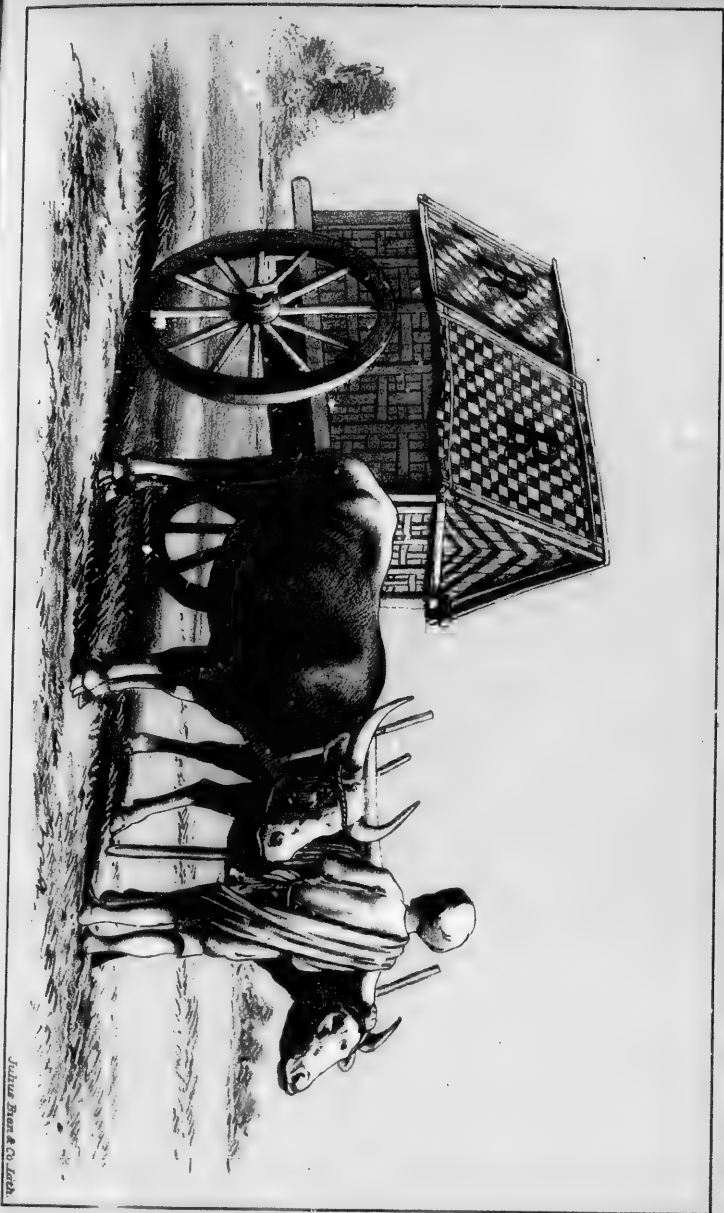


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ceit about his animal being fast, the poor thing will have to race, load or no load, with every other turnout of the same sort that comes along. Then the shrieks and wild howlings of the rival jehus are almost unearthly, and the twisting of the poor brutes' tails, as a last resort to increase their locomotion, is incessant and positively inhuman.

These little animals are treated with much care, and only used as roadsters; whereas the mothers, and in fact all of their cows, when out of milk, are put to the plow by the rural Singhalese, who would much sooner behave thus ignobly towards the weak and obedient females than be put to the bother and expense of keeping unruly male animals for such purposes.

The Singhalese cattle are of all colors—though black, very dark-brown, and red, are the prevailing colors. When white appears to any considerable extent it indicates an intermixture with other blood, and forebodes a want of hardiness. Many of the male animals are branded all over the body, in huge designs, after the style of lace or fretwork, and this is done for ornament originally, although there is a belief that it improves the stamina and condition of a bullock to so brand it. Accordingly, whenever an inhuman cartman has by overwork, cruel neglect, and starvation, reduced his animals to almost the last extremity, he gives them a few days' rest, meantime calling in some fiend with firing irons, who cauterizes the wretched creatures into popular condition for further labor.

In fact these people have a proverb (as I believe most other folks have) to justify moustrosities and foolishness), viz., that "the bullock will come to its owner once a year, and ask to be branded." Here let me state that this practice of such doubtful utility, to say the best of it, renders the hides of the animals almost worthless to the tanner, as, wherever a hot iron has touched an animal's skin, the leather will be fatally defective.

IMPORTED CATTLE IN CEYLON.

In years past, before railroads were common, and when, owing to a large production of coffee, money was plentiful, many excellent draft cattle of large size were imported, and Plate No. 4 fairly represents those of a breed coming from Tanjore, which, though of fair longevity in their own country, where the climate is dry, do not last long here when put to work in the interior where, at high altitudes, cold rainy weather prevails, causing amongst them such serious mortality that now, fresh importations having fallen off for want of a demand, but few respectable specimens of this really fine breed are to be seen here.

Some of our rich estate proprietors in prosperous times also got down Nellore cattle, bulls and cows, both for draft and the dairy purposes for which they excel, but the cost of their keep, for they require to be almost entirely stall-fed in Ceylon, and the absolute necessity for careful European control and supervision, which is expensive and not always to be had, render them a luxury which, owing also to early mortality, is somewhat transient, and only to be enjoyed by the wealthy, a class not common here now.

There are a few reputable specimens of these Nellore cattle still to be found in Ceylon, but I cannot regard them as fair representative types of the breed. There are also Australian of mixed European blood, and some English cattle, but the same conditions required by the Nellores also largely apply to them and are not available, consequently the breed is disappearing fast.

There are crosses between the English and some Indian breeds to be seen, which to my mind, especially on account of their superior stamina to withstand the varieties and peculiarities of the climate, are of greater local utility than their originals. Plate No. 5 represents poorly a good specimen of them, viz, a draft bullock well known here, possessing all of the best points in some measure of both varieties in his parentage and having their marked characteristics amalgamated and toned down in a highly useful and interesting manner, viz: the Nellores long and somewhat stilty limbs are shortened in the cross-bred and their proportions altered, so that the animal, though standing on shorter legs, has long and muscular thighs with short cannons, and the body, somewhat lengthened and broadened, covers more ground, which points, together with the retention of the massy fore quarters of the Nellore, renders its mixed offspring more efficient for heavy draft and capable of faster locomotion.

The photograph does the animal injustice with respect to these points, owing to the picture having been taken in a circumscribed space on a rainy day, and there was no opportunity of getting a better one. Occasionally one meets with a nice animal of this sort which it generally transpires on inquiry is prized by the owner above any other of his stock. The color is sometimes a light striped brindle, but generally a rich iron gray.

BUFFALOS.

The common Buffalos also inhabit Ceylon and are found both wild in the interior and partially tame in the Singhalese villages where they are kept and used to trample the paddy (rice) lands after plowing and to be sometimes milked, though not often, as they are fierce and troublesome, and their yield of milk small and of poor quality. Their flesh is almost inedible.

It is different, however, with their congeners from Southern India, which are larger and tamer, and often imported for dairy use in considerable numbers, for they are fairly tractable and give a good supply of wholesome milk, and being kept in the neighborhood of large towns and allowed to feed upon the commons, they present an interesting sight to strangers who are astonished at their almost hairless uncouth forms, the very exemplification of ugliness; and the wonder is still further increased, when the awkward beasts, to avoid the midday heat, wade deliberately into the neighboring ponds, submerging their bodies, until only their noses, raised almost perpendicular, protrude above the water, presenting the appearance of a shoal of alligators.

No successful attempt at crossing these animals with true cattle has, I believe, been made; the mixed progeny, whenever any appeared, having invariably died young.

SUMMARY.

It will be seen from what is hereinbefore written, that a species of dwarfed cattle, too insignificant in every respect for Western purposes, though well suited to the small wants of a simple people, is the only permanently successful and largely useful breed in the island; and this, by some natural interposition, is suited to live in a climate, graduating through all degrees of temperature, from extreme torrid in the low country, to mild frigid on the hills, and to subsist upon such poor vegetation as grows in the meanest soils of almost every description known

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to geologists; whereas no known breed of superior cattle can exist upon the natural pasturage of the island and endure the climate, accompanied with the tormenting attacks of the land leeches, which are common in damp weather, up to an altitude of at least 4,000 feet, unless it be in the Horton Plains, which have not been practically tried. Therefore, it seems impracticable to attempt the filling up of the tables attached to the circular letter now under reply, and for that reason I hope the omission will be excused.

I would have illustrated this report with colored plates, but did not consider it of sufficient importance to warrant so much elaboration, more especially as the photographs (except No. 5) fairly represent their subjects.

W. MOREY,
Consul.

UNITED STATES CONSULATE,
Colombo, November 1, 1883.

MALAYSIA.

THE WATER BUFFALO OF SIAM AND MALAYSIA.

REPORT BY CONSUL STUDER, OF SINGAPORE.

I have to acknowledge the receipt of a Department circular of date July 18 last, addressed to the consular officers of the United States.

I have carefully and repeatedly read and reflected upon the forms and memoranda just alluded to, and, while fully impressed with the great importance to the agricultural interests of the United States of the subject contemplated in the said circular, I can truly say, as a native-born Swiss and as an American citizen who has resided for a number of years in the State of Iowa, engaged in farming, owning and breeding stock, that any information I can give about the territory and provinces lying within the limits of my consular jurisdiction and adjacent countries or islands can be of no practical benefit whatever to the stock-breeders of the United States, whatever interest it may have otherwise as a contribution toward a full understanding of the whole question of cattle-raising; and were I ever so willing to obtain and give the information required in any way in accordance with the said forms and memoranda, I feel fully certain that no one here, with any degree of satisfaction to myself and to the Department, could give it to me.

The colony of the Straits Settlements and intervening Malay provinces under British protection (the territory within my consular jurisdiction) is not a cattle-breeding country, notwithstanding that districts therein are devoted, more or less, to agriculture; and very nearly all the cattle used in the same for beef and for draft purposes, the passenger traffic excepted, are imported from Siam and some of the suzerain Malayan provinces nearest to Siam proper; from Burmah and Bengal, but mostly from the Coromandel coast; and they are peculiar breeds of cattle not met with anywhere in Europe or America, and seemingly specially adapted to the tropics. They are lop-eared and hunchbacked, with a very thin covering of hair.

There are several varieties as to size, color, form, horns, and strength. The best as to weight and strength and power of endurance under a tropical sun come from the Madras coast chiefly, and occasionally from Bengal (the largest size), and Siam.

The cattle of the countries alluded to, I feel certain, could not endure the climate of the United States, except perhaps the extreme southern parts of Louisiana, Florida, and Texas. And as the cattle of our Southern States are much larger, finer, and inured to the climate, and giving far better returns in beef and dairy products (quantity and quality), I fail to see what any one would gain by importing stock for breeding or race-mixing purposes from India.

There are a few Hindoos engaged in the dairy business, keeping small herds of cows. They raise calves, keep the heifers, sell the steers to cartmen, while the old worthless cows are disposed of for beef. The owners of worn-out cattle, after allowing them a few weeks' rest on coarse tough grass (called ballang), sell the same also for beef, so called.

Beef cattle are really not indigenous to any portion of jungle-covered Malaysia; the buffalo alone finding subsistence therein. But the latter is not used for dairy purposes, and buffalo meat is only eaten, owing to its toughness and unpleasant flavor, by the lowest and poorest classes, chiefly Chinese, when it is eaten at all. But for purposes of heavy draft, such as plowing, cart, or log-hauling, the buffalo, being a ponderous and most powerful beast, much larger and heavier than our largest American ox, is unexcelled in point of strength and power of endurance; but mud-holes, fords, swamps, or creeks, places where he can wallow and bathe, are necessary for this animal. For the cultivation of rice he is therefore invaluable to the natives. He must be unhitched when he gets restive, this being a sign that he wants to bathe. If this is not done he becomes, as a rule, dangerous.

I have seen buffalos in size and weight about half way between a very large ox and an average elephant.

They have very heavy, ponderous, and peculiar horns, resembling somewhat those of the western American buffalo, only very much larger. They are a sort of mouse-colored (as a chief color), from pinkish blue to dark in shade, and have an exceeding thin coating of hair (if any at all), the tail (bushy at the end), ears, and head excepted. They are very numerous in the rice-growing districts in Siam, and everywhere met with where there are native settlements on the peninsula of Malacca and all through Malaysia, and at Penang more than at Singapore.

They are unsafe, often very dangerous and vicious. The Malays and natives of Siam, who breed them almost alone, understand how to manage and work them.

In the jungles of the Malayan peninsula there is a wild species, exceedingly dangerous, going in herds.

The buffalo (really known as the "Water Buffalo") I believe could not live, or not live long, outside of hot, moist, and swampy countries; he must have mud and water, and for that reason alone it would be extremely difficult to bring him over a great sea distance.

A. G. STUDER,
Consul.

UNITED STATES CONSULATE,
Singapore, November 9, 1883.

THE JAVA BUFFALO.

REPORT BY CONSUL HATFIELD.

I have to acknowledge the receipt of circular relative to breeding foreign cattle in the United States.

There is, however, very little, if any, information of interest bearing upon this important question procurable here, and but one kind of cattle that could be imported, if at all, into the United States; even then, the South would, for climatic reasons, have to be selected. * * *

I refer here to the Java Buffalo, an animal well-nigh indispensable to the native, a beast of burden when alive, and furnishing food, hides, and bone when slaughtered.

I am very sorry to say that, after having tried to get from more than one authority such data as desired on the second page of your circular, I find it not procurable, nor does it seem that any bureau, department, or private party can supply the same.

The buffalo is about the size of our ox—of a dull steel-gray color, though at times of pinkish-white. * * *

The animal serves as the ox when alive, and is slaughtered for food. The meat is, however, much tougher and coarser than that of ordinary beef, does not cost as much, and as a result is only consumed by natives and the poorer classes generally. His food is grass, and experience here has proven that he thrives best when not kraalled, but allowed to graze at large and in the neighborhood of a pond or slow-running stream of water. A buffalo will invariably take to this water, immerse himself up to his neck, and remain there happy and content for five or six hours every day if he can.

Certain portions of this island and Sumatra have suffered much during the past four or five years from a plague attacking this cattle, and the government has done all it well could to prevent a spread of the disease, with fairly satisfactory results. The plan adopted has been to promptly kill any animal attacked, and in many cases those with it in the same herd. Farmers in several cases have cried out against this system as entailing unnecessary expense upon the government (who make good the value to the owner) and hardship upon the farmers.

It certainly is seen that the treatment to which these animals have been subjected by European veterinary surgeons, in kraalling them and preventing their free access to the water, has not brought about the anticipated result, for many sound beasts have been found to get ill under it, thus causing the extermination of all.

OSCAR HATFIELD.

Consul.

CONSULATE OF THE UNITED STATES,
Batavia, January 11, 1884.

JAPAN.

CATTLE IN JAPAN.

REPORT OF CONSUL JONES, OF NAGASAKI.

I have the honor to acknowledge letter of the Department of State of July 18, 1883, desiring information relative to breeding cattle for the benefit of the stock-breeders of the United States.

Japan cannot be said to be a stock-breeding country. Previous to the arrival and settlement of foreigners in the country—now some twenty-five years—beef, milk, butter, and cheese were not used by the natives as articles of food, and were in fact unknown to them.

There are no words in the Japanese language for beef, butter, and cheese, except those recently framed from the English for convenience' sake, and in use only at the treaty port. These words are not known or used in the interior of the country.

There are no farms in Japan, as an American understands the meaning of the word farms. There are, instead, small fields and patches of ground, bounded by ditches and water-courses, which are highly cultivated, but more as gardens than farms. Consequently there are no ranges for stock, and the grass of the country is coarse and of poor quality.

Sheep will not live on the grasses of Japan.

The cattle are apparently a degenerate breed, brought originally from China or Corea.

The bullock is used as a draft animal for packing purposes, and in the cultivation of the soil—plowing, &c.

The cow gives but little milk; merely sufficient for their calves.

When killed and dressed by the butchers the cow will weigh from 250 pounds to 400 pounds; the bullock, from 350 to 450 pounds.

Beef in the markets at Nagasaki sells for about 12 cents a pound.

It will thus be seen that there are no facts connected with cattle-breeding in Japan that would be of any interest or use to the stock-raisers of the United States.

ALEXANDER C. JONES,
Consul.

UNITED STATES CONSULATE,
Nagasaki, Japan, December 12, 1883.

CHINA.

CATTLE IN THE YANG-TSE-KIANG VALLEY.

REPORT BY CONSUL SHEPARD, OF HANKOW.

I have the honor to submit the following as my response to Department circular of July 18, 1883, relative to cattle, their breeds in this consular jurisdiction, their treatment, and collateral topics.

The location of this consulate and its dependencies is entirely in the valley of the River Yang-tse-Kiang, extending from the port of Kiu-Kiang to Chung-Ching, a distance of about 1,000 miles. I have pursued investigations upon the points presented in the forms accompanying the circular, by correspondence and otherwise, for the entire distance, as thoroughly as the means at my command would allow, and the information given is as exhaustive as a summary will permit. It is presented in detail, rather than on the forms given, on account of the varied nature of the region reported on.

TOPOGRAPHY OF THE YANG-TSE-KIANG VALLEY.

The topography of territory presents differing features at differing points, but the soil, being all bordering upon the Yang-tse River, is principally alluvial, with loam, clay, and sand observable at special localities, but not generally predominant.

The altitude at any station in the entire district of country under consideration has never been taken, as far as I can discover. My only means of estimating it is from the flow of the river, taken in connection with distance from tide water. But the rate of fall per mile is indeterminate, varying so widely in estimates given that I cannot fix upon an average with any certainty. In low stages of water the effect of the ocean tides is visibly felt for three to four hundred miles from the sea. I judge, therefore, that the fall of the water is little more than would be produced by the curvature of the earth, and this leads me to conclude that Hankow is about 50 to 60 feet above sea level. Places farther up would of course have a proportionate altitude when situated in the river valley, but highlands in the interior, often approaching close to the river banks, rise to lofty elevations.

The temperature has no great variation in the whole distance, and I therefore select that at Ichang, for the year 1883, as that port is 400 miles above Hankow, and about the central point between the extremes of the territory.

Records of thermometer and barometer at Ichang for 1883.

Months.	Thermometer.				Barometer.	
	Highest.	Lowest.	Highest average.	Lowest average.	Highest.	Lowest.
January	53	30	44	35	31.61	30.75
February	52	31	45	38	30.46	29.96
March	71	41	61	50	30.30	29.64
April	77	49	68	59	30.32	29.51
May	82	60	72	65	30.18	29.60
June	80	68	83	72	29.95	29.69
July	93	71	85	76	29.87	29.58
August	92	73	88	76	30.06	29.68
September	80	61	78	70	30.27	29.77
October	80	40	60	62	30.54	30.06
November	64	39	54	48	30.50	30.01
December	56	34	53	41	30.56	30.12

From a short distance above Kiu-Kiang to near Hankow sandstone is met with, and is a very superior building stone, much used for foundations and trimmings for the more pretentious buildings, and also for banding the river banks.

About Hankow, and for miles above, limestone abounds, and immense quarries that have evidently been worked for centuries, with no signs of exhaustion, approach almost to the banks of the river, where lime-kilns are met with at frequent intervals, constantly employed in the process of calcining the stone for buildings and kindred uses. An immense traffic both up and down the river grows out of this industry, most useful to the people.

Clay also abounds, and bricks of extreme hardness, of flinty strength, of a dark slate color, are made in vast quantities. Crucibles are also made from clay in the near vicinity of Hankow, said to be of unsurpassed excellence.

Granite and gravel are found in a variety of locations, the former more inland than geological formations already referred to.

There are no grasses cultivated, and hay is not gathered as an industrial product. A coarse, wild, swamp grass is found everywhere. Wheat and oats are extensive field products, but I have never seen rye under cultivation here; and timothy and clover are unknown. Occasionally one meets with a few blossoms of small, sweet, white clover, and they are probably the result of scattered seeds from lawn planting by foreigners with imported grasses.

BREEDS OF CATTLE IN THE YANG-TSE VALLEY.

There are only two breeds of cattle in the entire region, and I think neither has any characteristics to recommend it for exportation and adoption, even for experiment in the United States. I present the characteristics of each separately, and other particulars will apply to both alike.

THE COMMON YANG-TSE CATTLE.

The common cow is a small-sized, compact animal, weighing about 400 pounds on the average, and produces young in the third year. She may be considered mature after that, and lives twenty years. The bull and ox of the species are 20 per cent. heavier than the cow, and all are broken to labor, the purpose for which they are kept, in the

third year. The color is generally a dark red, sometimes piebald. Limbs are short and bones small. Horns are short, nearly straight, blunt and ugly in form, usually of about equal size from base to tip. Milk and its components are little used by the people, and I cannot learn that butter or cheese is ever made, in this part of the Empire at least. The only estimate to be relied upon that I can give of their milking qualities I have obtained of a foreigner, who keeps a small dairy to accommodate the foreign population with milk only. From his experience about 3 quarts per day is the highest average. The flesh makes good beef when decently fed, but the animals are not killed until they are past breeding and too old for work. The dried skin weighs about 27 to 28 pounds, and the bones and offal are comparatively small. Calves are small, and the first year develop slowly. One familiar with fine milkers in the United States is surprised at the very small udders of these cows, and their teats are very small and diminutive. The milk veins, however, are large, and whether culture and careful breeding would develop profitable qualities only experimental trial can decide. The origin of the breed I cannot discover, but, from all I can learn, it seems to have been here as long as the Chinaman himself. The current value per head is not over ten and a half gold dollars.

THE WATER BUFFALO OF THE YANG-TSE.

The water Buffalo is the only other bovine in this region. It is the same animal that is found in India and Egypt. Webster's Unabridged Dictionary, illustrated edition of 1878, has a quite accurate representation of the animal. It is there described zoologically as "a species of the genus *Bos* (*Bos bubalus*), originally from India, but now found in most of the warmer countries of the eastern continent. It is larger and less docile than the common ox, and is fond of marshy places and rivers." This is a very correct idea of it. The cow is as large as a common ox in the United States. It is of a dun or slate color, with coarse hair, bristly and sparse. It comes to maturity in the fourth year, and gestates once in eighteen months thereafter, producing eight or nine calves in a life-time, which is about eighteen years. The young are broken to work in the second year, and the cows are quite as much used for milk as the commoner small breed, yielding a third more. It will perform double the labor of the small animals, and might be worth testing as a draft animal, but it is not to be forgotten that it is very sluggish at work, moving very slowly, and is not infrequently fierce and intractable. It will certainly thrive on much poorer food than our cattle at home, and it makes very good beef. The average weight of cows is 700 pounds, and of bulls and oxen 850 to 950 pounds. Its current value is \$15 to \$18 per head.

METHODS OF HOUSING AND FEEDING.

When housed at all, bamboo sheds are provided—poor affairs at the best, and yet about as good as the people who own them occupy.

Feeding for either class of the cattle described is only done in the winter months, when vegetation is destroyed; then wheat straw, rice straw, and sweet-potato vines are fed to them. The last are esteemed their best food. In the open season they are left to forage for themselves, browsing upon wild grass, bamboo shoots, and the foliage of the reeds that cover the marshes, or whatever else they can pick up. They are unrestricted in range by either fence or wall, and when for-

sometimes piebald, short, nearly straight, from base to tip. People, and I cannot get of the Empire at I can give of their keeps a small dairy only. From his experience. The flesh are not killed until dried skin weighs comparatively small. One familiar with very small adders minute. The milk and careful breeding trial can decide. In all I can learn, it is itself. The current

Y-TSE.

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only done in the wheat straw, rice last are esteemed forage for them. and the foliage of they can pick up, all, and when for-

aging are kept from cultivated fields by a guiding-cord attached to a ring in the nose, when a small boy leads them, or more often sits upon the backs of the animals and from his perch directs them to the best browsing grounds.

BREEDING.

No attention is paid to selection. The cows are allowed their own course under gestative impulse, and find their mates by force of instinct only. Hence the cattle have been bred in and in for ages, and have undoubtedly degenerated.

NUMBER OF CATTLE IN THE VALLEY.

The total number of either breed it is utterly impossible even to guess at, as no statistics are accessible, and probably none ever existed in any part of the Empire. The stock is amply sufficient for the needs of the people, but no surplus is exported, nor is any sort of product from the cattle an article of merchandise save the hides and horns. These indicate immense numbers of cattle scattered over the Empire; but I have never seen more than two or three animals the property of one man or one household. R. E. Bredon, esq., commissioner of customs, and a most intelligent observer, in a recent report commenting on the increase in the quantity of hides exported, estimates that five times as many animals are left alive as the skins represent, and well says:

It looks as if there must be many more horned cattle than is generally supposed, when the district within reach of one treaty port supports nearly 700,000 head.

Following out this idea, and of an approximation to the total number of cattle within a reasonable distance of Hankow, let me call attention to the export of hides from this port as given in my annual report for 1882, and more recently detailed by months for the same period. These show the total amount sent from this port alone at over 3,730,000 pounds. At the highest weight given for a single hide, 28 pounds, the total involves the slaughter of more than 133,000 cattle. But the returns for 1883 show a still more noticeable total. The export for the last year was 54,116½ piculs, equal to 7,215,545 pounds, of hides. At the rate of 28 pounds for each hide we have 257,698 skins, and if five living cattle were left behind for each one slaughtered it shows the enormous amount of 1,288,490 cattle on December 31, 1883, supported in the district of country furnishing the exports to Hankow alone. But I am bound to say I think the given weight of a single dried skin is about twice too large, and the allowance of five times as many live cattle left as are slaughtered too small by 100 per cent. If I am correct in this the total live cattle as given above should be quadrupled. Either conclusion shows the Chinese much more of a beef-eating people than they have ever been supposed to be.

EXPORT OF YANG-TSE CATTLE TO THE UNITED STATES.

The method of exportation, should any be desirable, would be by river steamer to Shanghai, thence by the Japanese steamers to Yokohama, and thence by Pacific Mail steamers to San Francisco, occupying probably six weeks. A native Chinaman to care for half a dozen cattle could be hired for \$6 per month, and the food would probably cost \$5 to \$10 per head per month. Passage money and cost of freight can better be learned at the Pacific Mail office than from me.

CONCLUSION.

I have thus endeavored to exhaust the memoranda accompanying the circular I am responding to. My report has been unavoidably delayed from necessity in the endeavor to be accurate, and from the great distances I have had to investigate, with very meager opportunities for intelligent correspondence. I believe I have touched upon all the facts that were suggested, and I trust to have acceptably met the purposes of the Department.

ISAAO S. SHEPARD,
Consul.

UNITED STATES CONSULATE,
Hankow, March 5, 1884.

CATTLE IN SOUTHERN CHINA.

REPORT BY CONSUL SEYMOUR, OF CANTON.

There are no cattle raised in the vicinity of Canton, or Southern China, that are desirable for importation into any other country. The cattle are generally of the Buffalo breed, with humps on their backs, and usually with little or no hair on their hides. Their meat is so undesirable that families who require good beef on their tables get it via Hong Kong from Shanghai. The cattle of Northern China are better than those of Southern China; and those of Japan being better than any in China.

Butter is unknown in this part of China, except as imported from Europe and America for foreigners' use.

CHARLES SEYMOUR,
Consul.

UNITED STATES CONSULATE,
Canton, November 7, 1883.

AFRICA.

CATTLE IN CAPE COLONY.

REPORT BY CONSUL SILER, OF CAPE TOWN.

Since receiving Department circular, dated July 13, 1883, containing instructions to report on the cattle industry of this colony, I have constantly used every endeavor to obtain the necessary data for such a report, but regret to have to state that my endeavors have not been connected with any flattering degree of success.

As a matter of fact, there has been little effort in this colony to improve upon the breed of cattle found in the possession of the Hottentots by the earliest settlers of the country.

This breed of cattle at this day is known among colonists as the Africander breed. By far the larger part of the cattle of South Africa belong to this variety.

With the view of obtaining the necessary information for compiling an intelligent report on this subject, I sent to several of the leading stock farmers the principal interrogatories contained in your circular. From some I have received no reply whatever; while others have responded, but, as a rule, with the confession that they possessed little or no knowledge of the subject in question. One prominent stock-dealer writes:

Regarding the information required by you with reference to the different breeds of Cape cattle, I regret that after keeping you waiting so long, and after thoroughly going into the matter, I should find it impossible to oblige you. At a glance it seemed the easiest thing imaginable, but on giving it a little thought I saw more and more the difficulty of carrying out my promise. I therefore went to several fellow cattle-dealers for assistance, and they expressed the same want of information which I experienced. We all agree, however, that the Africander is the only breed kept pure in the country. For information about that breed I went to our principal or rather largest meat merchants here, who could not give me the average weight of an Africander ox.

Another cattle farmer writes:

I have looked over the papers you sent, and think, after all, the mixture of cattle is so great in this country that it would be useless to attempt a report. The only breed we have pure is the Africander, and you had better send to the Free State for information.

Still another prominent cattle farmer writes:

To get the information requested upon the cattle industry, I regret to say, will take up too much of my time, and then I am afraid it will not be of much value, as the herds are not kept pure, being crossed and recrossed to such an extent that they cannot be classed.

Notwithstanding the discouraging tone of the above, my own observation, coupled with frequent interviews with Richard H. Stockdale, esq., of Wynberg, I have been enabled to gather a few facts which may not be uninteresting to the Department. The Africander breed are of moderate height, long in the leg, flat-ribbed, and require good pasturage to keep them in condition. In appearance some of the best specimens resemble the Devon, the horns being longer, and red being the prevalent color.

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YMOUR,
Consul.

For light draft on fair roads they answer tolerably well, being very fleet of foot.

The cows for milking purposes are all but worthless, giving but a small quantity of milk, though of good quality. In the best pastures they fatten tolerably well, but on dry, hard food readily succumb to hardship. Friesland bulls have been used in crossing, and have proved successful in improving the milking qualities of the cows, as well as better oxen for draft for heavy roads. It is a common practice among the farmers of the country, after using Friesland blood for some generations in their herds, to again have recourse to an Africander bull, in the belief that this strengthens the constitutions of the animals. This process naturally leads to no advance in the direction of any distinct breed. In some instances Shorthorns from England have been tried, but have not met with much favor.

In the vicinity of Cape Town the best-bred cattle are to be met with for dairy purposes. Kerry bulls have been put to half-breed Dutch cows, giving compact, handy little cattle. Jerseys for the same purpose have also met with some favor. Herefords have had but a limited trial in this colony, but so far have given great satisfaction in pulling through drought on dry food while other animals succumbed.

By some farmers it is thought that this and the Devon are the breeds best suited for the requirements of this country. The average weight of a decent-sized ox of the Africander breed is about 600 pounds dead weight.

There is great and ample room for improvement in the cattle industry of this country, but such can only come as greater care is used by farmers in segregating their herds; as at present, through carelessness in the castration of young stock, the progeny must necessarily be much mixed.

According to the census of this colony taken in 1865, there were 692,514 cattle; in 1875, 1,111,713. At this ratio of increase the number of cattle now in the colony would approximate something like 1,778,000 head; to this number may added about 265,000 head in British Basuto land and Transkeian territories which were not included in the census, making an aggregate of 2,143,000 head of cattle in the colony.

The average value of a sound matured work-ox is about \$50.

Milch cows vary in prices from \$30 to \$100, according to age and their milk-giving qualities.

IMPORTS OF DAIRY PRODUCTS.

Little or no interest is bestowed upon dairy business in the colony except in the neighborhood of towns. The majority of cattle farmers are the greater part of the year without milk or butter so far as any product from their own herds are concerned. For dairy products the colony is almost wholly dependent upon foreign countries.

Last year there were imported for the use of this colony 1,424,750 pounds of butter, and valued at £97,689; and 1,099,440 pounds of cheese, valued at £37,850. With little care and foresight this enormous expenditure could be saved to the colony.

No cattle are exported from this colony except coastwise and to the garrisons at St. Helena and Ascension.

JAMES W. SILER,
Consul.

UNITED STATES CONSULATE,
Cape Town, May 10, 1884.

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W. SILER,

Consul.

CATTLE IN SIERRA LEONE.

In reply to the circular just received from the Department of State (July 18) regarding *breeding cattle*, I beg to submit the following:

SIERRA LEONE CATTLE.

The cattle found in this country are not raised with any care whatever, and no attention is given to improving the stock. They are all of the common or scrub kind, of small stature, about the size of an ordinary two-year-old, and the cows are seldom or never kept for milk. Cow's milk is an almost unheard-of thing here; the only fresh milk, which perhaps is about 1 per cent. of the total used, is from the goat. Condensed milk in tins is the kind in general use, and to make any butter or cheese is never thought of.

HOUSING AND FEEDING.

There is no housing or artificial feeding of cattle in Sierra Leone; the climate being warm the year round they pick up their living wherever they can, and there is no pains whatever taken in breeding.

There are no cultivated grasses. Cattle are brought to town in canoes by the natives and sold to butchers and dealers and killed for the beef and hides.

PRICES OF BEEF AND CATTLE.

The beef is very tasteless and dry and is sold daily in the market at about 5 pence per pound.

The price of a live bullock is from £2 to £5, according to size. They weigh alive (I should judge) from 250 to 500 pounds. Color, mostly red or cream-yellow. Small horns.

EXPORT OF HIDES TO THE UNITED STATES.

There have been shipped from this port to the United States during the year 1883 to the present time (October 27), 66,938 dry hides; it is probable that 15,000 more will be shipped ere the close of the year, making a total of 81,938. This, no doubt, includes very nearly all the cattle killed in all this surrounding country which has any trade with this port.

The average weight of what are classed as good hides is 10 pounds each when dry, and they are bought by the merchants, who ship them to the United States at 6½ pence per pound for good hides, half price for "culls."

The mean temperature of this country is about 80° throughout the year.

The soil is loam and sand, with, in many places, a substratum of granite.

The surface stone is largely iron-stone, and is used extensively in building.

JUDSON A. LEWIS,

Consul.

UNITED STATES CONSULATE,

Sierra Leone, October 27, 1883.

CATTLE IN MOROCCO.

In a country where, like this, there is no means of getting proper statistics, it becomes difficult to give an exact and reliable report; still, on the whole, the breed are very inferior, owing to the neglect of breeders, and consequently totally unfit for the purposes suggested. On the contrary, if anything, the breeders require much improving by importation of other classes, and even that would give but doubtful results, cattle having, as a rule, to live upon the chances of abundance or scarcity of wild pasture, as the owners adopt no other means of keeping the stock in good condition.

FELIX A. MATHEWS,
Consul.

UNITED STATES CONSULATE,
Tangier, January 3, 1884.

GENERAL STATISTICS.

The cattle are called Moorish, but appear to be a cross-breed between Spanish and Algerian. They give an annual average production of 6 pounds of milk per day. From 12 to 15 pounds of milk are required for 1 pound of butter, and from 3 to 4 pounds of milk to 1 pound of cheese. At maturity the cow measures from 3 to 3½ feet, the bull from 4 to 4½ feet, and the ox from 4 to 4½ feet. The live weight of the cow, 2½ to 3 cwt.; of the bull, 3 to 5 cwt.; of the ox, 3 to 4 cwt. They mature at three years. The weight of meat at maturity is from 4 to 4½ cwt. The color is red, brown, and brindled black. They are Longhorn, same as Spanish. It is uncertain how long they have been bred pure. The origin of the breed is untraceable. Their labor is equal to one horse-power. The product of meat is about 300 cwt.; of milk, 1½ quarts per day. Very little cheese is made; it is imperfect and inferior.

The country is generally undulating; grazing country averaging from 50 to 300 feet above sea-level. The mean temperature is about 65°; in summer, 80° F.; in winter, 56° F.

The soil is generally alluvial in the Tangier district; loam, slight; clay, slight in the vicinity of Tangier. Sandy soil predominates in the vicinity of Tangier.

The substratum is a little limestone, a great deal of sandstone, not much granite, partly clay; gravel, &c., predominates.

There are no cultivated grasses.

There are no methods of housing. The feeding is grass and barley. The breeding is promiscuous. The products are handled in the most primitive manner.

CATTLE IN ZANZIBAR.

I have the honor to acknowledge the receipt of the circular from the Department regarding breeds of cattle, &c., and in reply I would say that it is impossible to fill out the questions asked, as there are no particular breeds of cattle in this vicinity, and what there are mostly resemble stunted buffaloes.

F. M. CHENEY,
Consul.

UNITED STATES CONSULATE,
Zanzibar, November 23, 1883.

MISCELLANEOUS.

CATTLE IN THE PHILIPPINE ISLANDS.

There is no cattle-breeding of any consequence whatever in the Philippines, only a few cattle being kept for draft purposes, while in all other respects buffaloes, a similar breed to the regular black African kind, are universally employed for farming and hauling. These also furnish the milk in use hereabouts; consequently there are no dairy products of any description. Sheep do not thrive here, and are sparingly imported from China for our butchers.

JULIUS G. VOIGT,
Commercial Agent.

U. S. COMMERCIAL AGENCY,
Manila, December 15, 1883.

CATTLE IN MAURITIUS.

I have the honor to acknowledge the receipt of circular bearing date July 18, 1883; also the memoranda accompanying the same, relating to the breeding of cattle in Mauritius.

In reply I have to state that the information required is not applicable to this island.

We have a few cows from France and the Cape of Good Hope, and the native breed is a cross between the two.

Beef for consumption is imported from Madagascar.

THOMAS T. PRENTIS,
Consul.

UNITED STATES CONSULATE,
Port Louis, Mauritius, December 17, 1883.

CATTLE IN THE SEYCHELLES ISLANDS.

I have the honor to acknowledge the receipt of circular bearing date of July 18, 1883, inviting a report on the domesticated animals of the country to which I am accredited. I beg respectfully to inform the Department that the cattle of Seychelles number barely three hundred, and that they are descendents of the wild African hump-backed cattle. These animals are very small and are comparatively worthless for either milk or beef. Four or five quarts of milk per day is a fair average of the quantity given by the better animals. No butter or cheese is made here. The beef is hard, stringy, and tasteless, and the fresh meat supply of Seychelles is augmented by importations of bullocks from the eastern coast of Madagascar. No statistics in regard to the domesticated ani-

mals which obtain here can be procured except as regards the number. Cattle are bred only for the private use of the breeder, and no great increase or decrease of stock could be expected in a country where pasturage is so limited as it is here and where the dairy is unknown.

EVELYN P. MUSSEY.

UNITED STATES CONSULATE,

Maké, November 26, 1883.

SPECIAL STATISTICS RELATING TO THE SEYCHELLES.

Topography.—Altitude, sea-level; temperature, mean, 80° F.; summer, 83°; winter, 75°; soil, clay and sand; substratum, clay.

Cattle statistics.—African breed; annual yield of milk 1,500 pounds; live weight of cattle, cow, 300 pounds; bull, 400 pounds; age at maturity, three years; weight of meat at maturity, 200 pounds; never housed; fed on coarse grass and cocoa-nut residuum.

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SUPPLEMENT

TO

REPORTS FROM THE CONSULS OF THE UNITED STATES ON
CATTLE BREEDING, DAIRY FARMING, AND THE MARKETS
FOR CATTLE AND CATTLE PRODUCTS, IN THEIR SEVERAL
DISTRICTS, IN ANSWER TO A CIRCULAR FROM THE DEPART-
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SUPPLEMENT.

AMERICAN VS. DANISH AND FRENCH BUTTER IN CEYLON*.

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There was an importation of butter here direct from the United States, which was largely advertised to be offered on arrival at a price which, if the article were good, would insure a rapid sale. Unfortunately it proved to be salted butter in tins, and the condition was not excellent; not, in my opinion, from any fault in the butter itself, which in color and consistency appeared to me quite perfect, but from a strong alkaline flavor pervading the mass, rendering slightly offensive that which otherwise might have been pure and wholesome food.

I have satisfied myself that the whole mistake about the butter was, first, in salting it at all; secondly, in the use of impure salt, say that which had not been completely cleansed of the several sulphates and oxides which ordinary culinary salt is known to contain; thirdly, that the tin cans were of an inferior quality of tin plate, which therefore lent its impurities all the more readily to the corrosive action of the not very pure salt.

Some people here will not accept this theory, but believe that the butter was of poor quality when packed. I think differently and regret this circumstance, which must in a measure bring American butter into discredit in a place where I have often extolled its purity and goodness, and where it unquestionably may find a profitable market if exhibited to the customers in anything like its native excellence; and I would advise our producers and packers who propose preparing canned goods for export to employ as little salt as possible, and to be sure that whatever of that article is used is pure; also to make their cans of the very best tin plate and solder that are manufactured.

I inclose duplicate samples of the tin containing the American butter above mentioned; also, samples cut from a Danish butter tin, the difference in quality being very noticeable; and would add that whereas the Danish butter sells rapidly for 65 cents per pound, the American sells slowly for 45 cents.

The French are sending to the Orient large quantities of butter, in 1 and 2 pound bottles, with mouths about 2 inches in diameter, glass stoppered, and secured with hard white cement, so as to be perfectly air-tight. The butter is fresh, but, after being packed, about one tablespoonful of white pearly salt, almost impalpably fine, and exquisitely pure, is put into the neck of the bottle, and the stopper secured. This butter retails almost unlimitedly at 65 cents, gold, per 1-pound bottle, and at 55 cents per pound in 2-pound bottles. As our country has now become famous for its excellent glass, and there can be no question about the conservation of butter in vessels formed of that material, I see no reason why our exporters should not pack their butter after the French style, also their cheese, and thereby secure the preservative qualities of these two great articles of universal consumption, as well as a never failing market in the Oriental hemisphere.

CHEESE AND BUTTER MAKING IN ITALY.

REPORT BY CONSUL CRAIN, OF MILAN.†

The Italians devote themselves to the rural arts with Virgilian enthusiasm. The plains of Lombardy are cultivated with the care bestowed on garden plots in other

* Extract from a report by Consul Morey, of Colombo, Ceylon, published in No. 4 of the Consular publications.

† Republished from Consular Reports No. 10, for August, 1881.

countries. Cattle improvement is a study of the Italian farmer. Care, skill, and science are used in the preparation and manipulation of the products of the dairy. Italian butter and cheese, though expensive, are used on every continent; and such is their excellence that, despite that strange but universal fancy for foreign articles, Italians prefer them.

A successful imitation of Italian cheese in the United States would enable our dairymen to supply the demand for it in our country, and export it to those lands where it is used. As the cost of production is but slightly more than that of American cheese, the justly high price that it commands would make its manufacture profitable. The practicability of imitation is shown by the recent successful copying of Swiss cheese in our country; its utility by the large exportation of these imitations. I will minutely describe, from observation and official data, Italian cheese-making processes to enable the cheese-makers of the Mohawk Valley and other dairying districts of our country to produce it in their factories.

Milk foods.—The Piedmontese make butter and many kinds of cheese, of which *grugera fontina*, *rubiole*, *grana*, and *stracchino* are the best. *Grugera* and *fontina* are made from the Estival pasturage of the valley d'Aosta. *Rubiole* are small sheep's milk cheeses of Alba, Mondovi, and Aequi, whence they are considerably exported. *Grana* and *stracchino* are Novarese products. The former is made during ten months of the year; the latter in October and November. The mode of preparing them is being improved; but the increased price of butter induces its extensive manufacture to their detriment.

A large quantity of excellent butter, *grana*, and *stracchino* is made in Southern Lombardy and Mortara. Lecco, Varese, Bergamo, and Brescia produce good *stracchino* and butter. Delicious cheeses, called "*formaggini*," are made on the rich pasture of the Valtellina hills.

Inferior butter and cheese are made in Mantua. Lodi, Pavia, and Milan, which produce 24,000,000 pounds of butter and 60,280,000 pounds of cheese, are the best dairying districts of Lombardy. The cheese of Venetian factories is poor, but the butter of the mountains of Caprio, Rasato, and Valdarno is justly famous.

In Asiago there are 85 creameries and cheese factories, employing 300 hands, and annually producing 33,400 pounds of cheese and 37,400 of butter.

The dairying interest in Liguria is small. The Emelian plain, between the Panaro on the east and the Tribbia on the west, is, with Lower Lombardy, the center of Italian cheese and butter making.

There are 35 factories with 50 cows apiece in the Piacenza district, annually producing 286,000 pounds of *grana* and 124,000 pounds of butter. Owners of two or three cows send their milk to these factories for working.

Dairying is the chief rural industry of the Parmesians. Their *grana* (called "*parmigiano*") is sent to our country. The 129 "*casselli*," or establishments where it is made, are scattered on the plain and on the hills, and have 184 caldrons for the boiling of milk, and 130 churns for butter making. In their production of 1,650,000 pounds of milk, and cheese, they consume 9,000,000 quarts of milk. The working season is from April to November, though 20 "*casselli*" are open all the year.

The Emelian cheese keeps well, is improved by age, and much used as a relish with meats. It is made as in Lombardy, but because the cream is only removed from one milking, the percentage of poor cheese is less. In Umbria and the Marshes they make a considerable quantity of cheese of sheep's and goat's milk, and a little of cow's milk. That made on the mountains of Visso, in the Camerino district, is excellent and celebrated.

The small Marcerata region produced alone, according to the last report, 160,000 pounds of cheese per year. It has but few cows, and those of Tuscan and Swiss stock. They give, on an average, from 11 to 13 quarts per day. In some factories cheese is made of sheep's, goat's and cow's milk mixed. Cheese of the first kind is extensively exported and sells, where produced, at 15 and 20 cents per pound. It obtained prizes at Florence, London, and Paris. Its excellence is due to the healthy and aromatic plants which abound on the Marcerata hills. From sheep's milk the Spoletese produce annually about 770,000 pounds of cheese. One of their factories makes yearly, from the milk of 70 choice Swiss cows, 23,000 pounds of cheese and 2,000 of butter. The sheep's-milk cheese, called "*erete*," of Siena, Tuscany, is well known and good. It bears a distinctive name, but is not made by special process. It is prepared by peasants, without system, and in small lots. Factories for its scientific manufacture have been recently erected. Little cheese is made in Lazio, owing to the scarcity of sheep and the poor quality of the milch cows.

The sweet cheeses of the southern Adriatic provinces of Italy, called "*marzoline*," are said to be delicious, and equal to any produced elsewhere.

A Government committee reported some years ago that their excellence was due to rich milk; that old modes of cheese making were followed; that dairying, including utensils, milking, quality and quantity of rennet for coagulating, cheese making, salting, and pre-

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serving was intrusted to empirics; and that to judge, *a priori* it was sufficient to glance
at the wretched dairies surrounded with dirt and permeated with odors. Molise produces
27,000 pounds of cheese per year, and Terra d'Otranto 35,000 pounds, or one-third more
than in 1870.

Among the Southern Mediterranean provinces-Catanzaro is famous for its butter;
Caserta for a peculiar cheese called "*mozzarella*," and Potenza for excellent sheep's-milk
cheese. The Casertese make 22,000 pounds yearly, and 26,000 pounds are made in Ben-
evento. The cows of the Modica district of Sicily are large milkers, and the pasturage is
so rich that their milk contains fine butter and cheese-making properties. The cheese pro-
duced is equal to that of Parma, Lodi, England, or Holland. Cows stabled give from 20
to 22, and many from 30 to 38 quarts daily. They do not give milk in winter or at
other times when the food is scarce. Sicilian sheep give 1 and goats 2 quarts per day.

In Sardinia two kinds of cheese are made, viz: that of cows' and that of sheep's milk.
Of the latter kind about one-third, or 300,000 pounds, is exported. The Sardinians also
produce a large quantity of butter.

Modes of making.—In making Piedmontese cheese the milk is used when tepid. It is
mixed and shaken in whey, which curdles it in one-quarter of an hour.

The curd is shaken for drainage, and when dry pressed in a form. Sometimes this
cheese is made of partly skimmed milk.

Stracchino, of Gorgonzola, is made of milk containing the buttery parts. When the
mountain pasturage is exhausted the Bergamese herdsmen drive, for wintering, their
herds to the plains. Gorgonzola is their favorite halting spot, for there they first find
the luxuriant vegetation of the Lombardian plateau. These herds reveling on the rich
grasses of Gorgonzola are, from the middle of September to the end of October, very lac-
tiferous.

Cheese is made during these months in small rooms devoted to it in the homes of the
Gorgonzolese, who buy the milk of the herdsmen. The autumn temperature, being
moderate, is best for cheese making, as too much heat, by hastening the separation of
the whey, makes it too dry and friable, while excessive cold produces a whey acid,
and easily-spoiled cheese.

The milk while warm from the cow is curdled with well-preserved and prepared calf
rennet. The quality of the cheese depends much upon that of the rennet; and experi-
ence guides as to the quantity required. In fifteen or twenty minutes, when the milk is
coagulated and the whey separated, the curd is hung in hemp-cloth bags to drain. As
cows are milked twice daily the foregoing is twice done, viz: mornings and evenings.

The morning-drained curd, inclosed in light, flexible, wooden bands, covered on their
inside surface with hemp cloth, is placed on an inclined board strewn with rye chaff.
Being of two milkings the curd is partly warm, partly cold, and, though mixed, care is
taken to form the upper and lower strata of the warm, because it is cementsitious. As
hot and cold curd never perfectly unite, minute interstices remain in the cheese, in
which, while maturing, green mold, known as "*parsley*," forms and gives the *stracchino*
the delicious taste for which it is famous.

The curd is further drained during the first day of the process by two or three turn-
ings. On the following morning, when of some consistency, the cloth being removed, its
value is determined by weighing. After three or four days fermentation begins, and the
wooden bands are removed. It is then, once daily for eight or ten days, alternately salted
on its upper and lower side, 4 ounces of pulverized salt being, on an average, used per
form, or 33 pounds. The Gorgonzolese adopted some years ago the process of quickly
turning and pressing the cheese against a salt-covered surface, thus insuring more uni-
formity and a better crust.

The color changes in a month to pinkish-white, if good; to black, if bad. When
black the crust is soft and the cheese perishable in summer. If the crust is sufficiently
hard the shade is improved by one or two dippings in salt water.

The time of maturity depends upon the temperature (which is best from 10° to 15°
Centigrade), manner of making, and quality of the milk. The Gorgonzolese *stracchino*
begins to ripen in April, and continues till September. One hundred quarts of milk
make about 25 pounds of this cheese.

Bellunese cheese is made by heating the milk, pouring in rennet, letting it coagulate,
breaking it into medium-sized pieces, reheating it, putting it in wooden tubs, salting and
placing it on stands for daily turning, and resulting until consumed.

The following process makes a kind of Frinlani cheese known as "*fieno*." Milk
heated until tepid in caldrons is mixed with rennet and left to curdle. The curd is broken
in vessels into small pieces, and violently shaken over the fire. When thus crumbled,
the caldron being set on a stand, it is gathered, thrown into the "*talcio*" or forming-
tub, placed on tables for drainage, dried, and finally immersed in brine.

Other Frinlani cheese is made with milk tepid in heaters and thence poured into
wooden vats for coagulation. The curd formed is wet, broken into large lumps, re-moist-

ened with hot whey or water, gathered, and pressed in wooden hoops. It is less solid than that next before described.

Formaggio di Trana.—Milk is poured into caldrons and placed on the fire. If mature, i. e., bluish (as it should be in summer), it is warmed to the twenty-fifth degree; if sound, i. e., retaining the whiteness and sweet taste of freshly milked, it is heated to the thirtieth degree. At this temperature, as tested by the hand, it is removed from the fire and mixed with rennet. One-sixth of an ounce of rennet is used per 720 quarts of milk. The rennet is dissolved with a pestle in wooden cups, filtered through horse-hair sieves, and turned with the cream-turner, *rotilla* (or stick with wooden disk at end), and *spina* (or cane with twisted twigs or iron pins at one extremity). To prevent hardness the curd formed is broken and turned with the cream-turner, *rotilla* (or stick with wooden disk at end), and *spina* (or cane with twisted twigs or iron pins at one extremity). This is continued for three quarters of an hour, while concretions appearing on the surface are removed by hand.

Turning is stopped for two or three minute intervals to consolidate but not harden the now softened or dissolved curd. The whey is removed and one-sixth of an ounce of saffron, per 110 quarts of milk, thrown into the caldron. The curd is replaced and left for one hour on the fire, heated to the forty-fifth degree (but not higher), and continually stirred with the *rotilla*.

A cup is filled with curd for examination as to the minuteness of its particles. If small enough the caldron is removed, and the curd sinks and forms on its bottom. To hasten this the cooled whey (before drained off to enable the adding of saffron) is poured into the caldron, the bottom of which is pressed with the *rotilla* to unite and incorporate the curd. The curd is loosed with a stick from the sides of the caldron, lifted, drawn on the surface, collected in a cloth, placed and left for one hour in a vat, and there wet with whey. It is marked with the name of the owner of that day's cheese, pressed for drainage by hand in a box of narrow beech boards bound with hoops and pack-thread and covered with linen, a wooden disk, and a heavy stone. When dried these coverings are removed and it is rewet with whey, and then covered with buckram, which, under pressure of the disk and stone, makes reticulated imprints on its circular surface. After some hours the buckram is cut, and the clippings removed to permit the whey to dry in. It is covered and rubbed on an oak bench with salt, dipped in salt water, and repressed between the beech boards. Sometimes several forms are simultaneously pressed to improve the under by the salt moisture from the upper. It is resalted every other day for two weeks, then put in the cheese-house, where superfluous salt is removed by scraping. In September it is rubbed with cheap oil.

The cows of the numerous dairies of Puglia and Basilicata are milked once daily. Their milk, when poured into large vats, is divided and half heated to a point which will make it and the unheated mixed, when tested by the hand, 39° Reaumur. Whey of goat's milk is mixed and shaken in it. While curdling it is covered with a cloth to keep up the temperature. When curdled it is broken, stirred with the *rotolo* till in fibrous-sized pieces, placed with whey in a vat, rebated, wet, and covered with warm whey to "grow."

When by heating on hot coals or boiling in water ductility is obtained, the curd is called "*creseculu*," or grown. This property acquired, it is cut, the pieces thrown into the pail, where they are wet with hot water, reunited, manipulated, pulled into thread, and made into as many balls as there are cheeses to be made. These thread balls are immersed in the water which served to make them, manipulated till homogeneous and compact, formed by hand into proper shapes, and daily salted for two or three days. Cheese thus made is called "*caciocavallo di Puglia*."

The *caciocavallo* of Calabria is a cows' milk product, prepared by slight modifications of the usual cheese-making process. Upon coagulation turn the resultant mass, and gather, after due heating, the caseine. Form it, by stirring and pressure, into uniform and consistent paste; subject this, in vats, to the action of hot whey; thence remove it to tables for working, where, arranged in orbicular forms and covered with cloth, leave it to the chemical action of its constituent parts. During this time, when fermentation begins, it is cut in slices, which are immersed and shaken in hot water, manipulated to drain off the whey, &c., reduced by water and heat to homogeneity, replaced on tables and rendered soft, adhesive, and ductile by frequent dipping and turning in cold water. In this state it is divided, shaped in oval forms, kept the first day in cold water to produce elasticity and consistency; the next, in salt. Thus finished, it is fastened to the end of a stick, and hung from the beam of the cheese-house.

Cows' milk, when coagulated and lightly broken, produces a semi-solid excretion or discharge, which forms the essential substance of *rasco* cheese. This is placed in vats, lightly shaken; dipped quickly three or four times in hot whey, removed, and replaced when sufficiently solid, upside down, in these vats; then kept for twenty-four hours, slightly salted and taken to cool, dry rooms for keeping. This cheese is made from June to October, the season when the milk is most buttery. It is soft, white, and soluble at a low degree of heat.

hoops. It is less solid

and on the fire. If mature, a twenty-fifth degree; if milked, it is heated to the point it is removed from the fire and per 720 quarts of milk, through horse-hair sieves, the curd formed is broken (disk at end), and *spino* is continued for three are removed by hand. It is not to harden the sixth of an ounce of salt is replaced and left for (higher), and continually

of its particles. If small its bottom. To hasten saffron) is poured into site and incorporate the aldron, lifted, drawn on in a vat, and there wet at day's cheese, pressed with hoops and pack-one. When dried these covered with buckram, mprints on its circular removed to permit the th salt, dipped in salt several forms are simul- a the upper. It is re-use, where superfluous ap oil.

are milked once daily. ted to a point which is 39° Reaumur. Whey covered with a cloth to th the *rotolo* till in fil- vered with warm whey

obtained, the curd is the pieces thrown into ed, pulled into thread, ese thread balls are in- till homogeneous and r two or three days.

y slight modifications resultant mass, and pressure, into uniform ey; thence remove it ed with cloth, leave e, when fermentation ater, manipulated to y, replaced on tables urning in cold water. in cold water to pro- it is fastened to the

mi-solid excretion or is placed in vats, moved, and replaced r twenty-four hours. se is made from June white, and soluble at

Sicilian caciocavallo is made of cows' or goats' milk, and coagulated like sheep's milk cheeses. When curdled it is not heated in water but broken with a piece of wood, the whey removed, dried, and taken from the tub to the trough. Then the curd is sliced, replaced in the tub, cooked in boiling whey, removed to the trough, pressed to solidity, cooled, placed and left for twenty-four hours on a stand or table, sliced, thrown into boiling whey, recooked till viscid, gathered, pressed, drawn by hand, reduced to paste, formed in pumpkin-shaped pieces, salted for twenty-four hours, and hung, prepared for use, in the cheese-house.

Provaturo cheese is made of cows' milk. The cows are only milked mornings, when their milk is poured into a large pine, tub-shaped receptacle. Only when the atmosphere is cold is it previously slightly heated. Dissolved kid rennet is poured into it, the mixture turned with the *rotolo*, and then left quiet. Upon coagulation the curd is not allowed to become lumpy, but is pressed and softened with the *rotolo*. When the curd sinks in the vat a sieve of pierced tin is placed and held over it with weights. If much whey rises it is used for *ricotta*; if little, the sieve is removed, and it is left on the curd to facilitate "growth," as before defined. When ductile it is cut in small pieces, placed in another pile vat, and previously prepared hot water poured upon it. Here the curd is kept till cooked, when the water is drawn off. It is then, in portions, gathered, and stirred with a wooden spoon, and formed, by hand previously wet in cold water, into two-pound balls, which are put, and left for some hours, in tubs of cold water, and finally slightly salted.

BUTTER-MAKING IN ITALY.

Butter, when made in families who have little milk, is made in cylindrical churns, in which the cream is shaken by movement of the churn-handle. Factories use large cylindrical churns on trestles, in which are wings turned by machinery. The butter they produce is cleaner than that made by hand-churns.

In Pavia, cream of 6° or 7° R. is shaken in round boxes called "*puraggie*." Each box has a spoon fastened to an axle. This axle is turned by a crank, and revolves the spoon around the inside periphery of the box. The process requires two men. Some use a cradle-churn, which saves labor and produces equally good butter. In Cremona the American machine is in general use, namely, a horizontally fastened tub, in the interior of which is a reel similar to that used in silk-making.

The dairymen of Parma beats the milk with a cream-whipper, and skillfully lets the floating cream, which gathers in the bucket, overflow into a fine-edged wooden bowl, and thence into the churn. In summer it is customary to add 10 pounds of ice to every 30 quarts of cream, while in winter some cream is heated and turned into the churn with the rest. The temperature is always kept from 10° to 15° Reaumur. When in the churn two men alternately beat the cream with a butter-beater joined to a straining-frame, raising and lowering it by leverage. Butter should begin to form in three-quarters of an hour. When it is necessary to hasten formation, water is added—where advisable to retard it, ice. If made before the time mentioned, it is soft—if after, hard and set. When prepared it is taken from the churn, worked with the hands, formed into blocks, and left to drain. The blocks are frequently adorned with impressions made with a wooden stamp. The skimmed milk is used for the *ricotta* cheese.

In Catanzaro butter is made with the old-fashioned churn, a miserable mechanism, causing loss of milk and time. The manner of keeping butter there, though simple, is exceedingly ingenious, consisting in inclosing it in small bladders, in which it can be conveniently kept and carried without danger of change.

At Modica, where the butter is delicious, it is not made directly from the cream, but from the "*ricotta*," which is obtained by boiling the small milk after extracting the caseine.

The butter-maker of Sardinia puts the "*ricotta*" in a bowl of cold water, and shakes and presses it between his fingers. In a half hour a white scum appears on the surface of the water, and by continued movement and pressure of the "*ricotta*" increases during the succeeding half hour. This scum is the butter of the "*ricotta*."

Dairy associations and cheese factories.—It is hard to determine the epoch in which the first dairy associations were formed. It is known that they were numerous in Savoy in the Middle Ages, and that they have existed since remote times in the French Jura and on the Alpine slopes. Where land is owned in small plots, as in the mountainous parts of Upper Italy, and where large dairies, consequently, do not exist, the making of cheese is impossible, unless assumed by a manufacturer who would buy the milk from the cow-owners, or unless these, in partnership, prepare it.

The advantages of dairy associations and cheese factories are numerous. One cheese-making establishment, set of machines, and utensils answer for many milk-owners, lessen the cost of production, increase and improve the product, facilitate sales, save

time, and permit farmers and their workmen to be otherwise usefully employed. These considerations moved the Italian Government to offer, in 1873 and 1874, several prizes, of which the highest was \$240 and a gold medal, to the best managed association, under articles of copartnership, organized for the manufacture and sale of butter and cheese, or either, to be thereafter started, composed of at least ten associates having equal rights, working 340 quarts of milk per day, and having a cheese-maker in their sole employ.

Since then cheese factories have greatly increased in number and improved in management. They are everywhere in Italy except Sicily, where small milk-owners carry their milk to the large, and when, after a month, they have delivered to these 250 or 300 quarts, they receive that quantity back at one time. This system of reciprocal loans is mutually beneficial, as a large quantity of milk worked at one time makes more cheese than the same amount worked in small quantities at different times.

I trust, sir, that my suggestion of imitating Italian cheese will commend itself, and inure to the benefit of our dairymen; for while it is a proud thing for a people to teach, the secret of national prosperity consists in having the manliness to learn.

THOS. C. T. CRAIN,
Consul.

UNITED STATES CONSULATE,
Milan, May 31, 1881.

THE MANUFACTURE OF SWISS CHEESE.*

REPORT BY CONSUL ADAMS, OF GENEVA.

The manufacture of cheese is one of the most ancient industries of Switzerland, instruments for this purpose having been found in different parts of the country among the ruins of the "lake dwellings," whose date is anterior to all historical records. In the fourteenth and fifteenth centuries the production had grown large enough to become the subject of legislation, as appears from some curious decrees of Berne, Glaris, Appenzell, and other countries, prescribing the form and weight of the cheeses, and forbidding the manufacture of certain sorts or any exportation to foreign countries. At the end of the last century the methods of manufacture were of the rude kind still in use among the mountains and in the remote districts, each household making what it needed without any special conveniences or skilled processes. The modern manufacture dates from the introduction, 80 or 90 years ago, of the cultivation of artificial fodder (*fourrages artificiels*), and the system of stabling cattle, now universal in the lower valleys and the plains. The improvement of quality created a wider demand at home and a new market in other countries, and to-day the better kinds of Swiss cheese are as much a product of skill and high art as the Swiss watch.

The several varieties are classified either according to consistency of material, as *dur*, *ferme*, and *mou* (hard, firm, and soft), or, according to the proportion of fatty matter, as *gras*, *mi-gras*, or *maigre* (rich, medium, or thin), or, according to the coagulation, whether by rennet (*à présure*) or by sour milk (*à lait aigre*). Table A gives a description of the better-known varieties according to the qualities indicated, and Table B an analysis of selected specimens of some of the same varieties. With the exception of the *Facherin* (*Mont d'Or*), which originated in France, and the *Urserein* from Italy, and a few imitations of foreign styles like the Limburg, all the kinds named here are native and peculiar to Switzerland.

The best and the most abundant of the Swiss cheeses is the *Emmenthal*, a round cheese, 80 to 100 centimeters in diameter, 10 to 15 centimeters thick, and weighing from 50 to 100 kilos or more. Like all the rich cheeses (*fromage gras*), which retain nearly all the elements of the milk, its nutritive value is high. It was first made in the valley of the Enne in the canton of Berne, whence it followed the Bernese emigration into the neighboring cantons, where it is now made in large quantities, and into Bavaria, Russia, North Germany, and North and South America. The exportation began in the last century to Germany and Italy, and now it is sent everywhere, the principal markets being Germany, Russia, Italy, and the United States, where, I believe, it is known as *schweizer käse*. In winter a good deal of *Emmenthal mi-gras* is made, mostly for France, where it takes the place of butter.

Next in importance is the *Gruyère*, called after the village of that name in Fribourg, another round cheese 60 to 70 centimeters in diameter, 9 to 12 centimeters thick, weighing 30 to 45 kilos. It has come into great repute within the last ten years, since the

* Republished from Consular Report No. 15, for January, 1882.

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OS. C. T. CRAIN,

Consul.

CHEESE.*

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formation of a wealthy society for its manufacture in Fribourg. It is also made in large quantities in Vaud and Neuchâtel, and the French provinces of the Jura and the Doubs, where according to some writers it originated about 1750. It is manufactured in much the same way as the Emmenthal, except that a third or more of the cream is removed, whence it is classed as *mi-gras*. The exportation is mostly to France, Italy, and recently to South America.

The *Spalen*, so called from the manner of packing for shipment, is a cheese *mi-gras*, 45 to 55 centimeters in diameter, 8 to 10 centimeters thick, weighing 18 to 23 kilos, and made in a much ruder manner than the Emmenthal and Gruyère. It comes from Unterwalden, Uri, Schwyz, Lucerne, and the Bernese Oberland, and is sent to Italy, where it is used grated (*fromage dur à râper*) with macaroni, rice, polenta, &c. It comes to perfection in two or three years. Another variety made for the Italian market is the *Urseren*, which comes from the higher pastures of the valley of that name. It resembles the cheeses of Northern Italy, as does the *Formaggio della paglia*, and the *Battelmatt*, both produced in the canton of Tessin. Most of these varieties are disagreeable to a palate unaccustomed to them.

The cheese of the canton of Appenzell, long famous for its fine cattle and excellent fodder, differs in certain qualities from all the other Swiss varieties. In making it the curd is triturated in a brassoire, molded without pressure or salting, and finally treated with a brine of water, wine, lees of white wine, pepper, and salt, which gives it a pungent odor and flavor, something between the Swedish and Italian cheeses. The exact formula for the brine is supposed to be a secret, and, as with most of the Swiss cheeses, the processes of manufacture is only to be learned in its own country, where the traditional methods have been handed down for generations. The Appenzell is a cheese 25 to 30 centimeters in diameter, 12 to 15 centimeters thick, weighing 7 or 8 kilos, and is exported to all neighboring countries, but mostly to Suabia.

Still more remarkable is the *Schnabziger*, or green cheese (*fromage vert*), known, I believe, in the United States, under the corrupt name of sago or sapsago, and which some writers hesitate to class as a cheese. Its manufacture dates back to the ninth or tenth century, and it is still the most famous product of the canton of Glaris, which turns out a great many other varieties, mostly *mi-gras* and *maigre*. The peculiarity of the *Schnabziger* is due partly to the method of coagulation by *azi* instead of rennet, and partly to treatment by the *zigetec* (*melilotus cœrulea*), a plant grown for the purpose in Schwyz. In 1869 the exportation amounted to 1,250,000 kilos, valued at 750,000 francs. It is sent all over the world.

The foregoing are all export cheeses, principally consumed out of the country. The variety manufactured for home consumption is endless. Some of them are of great excellence, but will not bear transportation. The following may be recommended to the attention of importers in the United States:

The *Gessenay*, made in the high pastures about the village of that name in Berne and elsewhere in the Oberland. It is a cream cheese (*gras*) of fine aromatic flavor, very hard, and keeping well for many years. Its nutritive value is high, and it should be used like the *spalen* or parmesan, grated with soup, macaroni, &c. A similar cheese is made in the canton of Valais. This is perhaps the richest of all the Swiss varieties, and has a peculiar flavor of its own. The process of manufacture has greatly improved since 1872. Less durable but equally nutritious and palatable, and of the same general character, is the *cristallina*, made in the valley of Medels Grisons.

The *Vacherin* is the only soft cheese of large size made in Switzerland. There are two sorts, the first made about Gruyère, and in appearance like the cheese of that name; the other is made in the valleys of the Jura. The latter is 25 to 30 centimeters in diameter, 4 to 6 centimeters thick, and weighs 3 to 5 kilos. It is sold in drums, and if perfectly mature has an exquisite flavor. The *Mont d'Or* of France is the same as the *Vacherin* of the Jura.

Some of the Swiss papers have rather ridiculed a suggestion in one of my previous reports that a market might be found here for American beer, cheese, and butter. In the matter of cheese, the competition of the imported article would be with none of the foregoing kinds, some of which have little or no sale in the country, and some are in demand for the special qualities, but with the ordinary kinds made everywhere in great abundance for home use and largely taking the place of butter, and even meat. I believe that a good American article that could be put on the market here at 150 francs the kilo would find a sale.

CATTLE AND DAIRY FARMING.

A.—Quality of different Swiss cheeses.

Description.	Consistency.	Fatty matter.	Coagulation.
Emmenthal.....	Firm	Gras	By rennet.
Gruyère.....	do.	Mi-gras	
Spalen, old.....	Hard	do.	
Spalen, new.....	Firm	do.	
Urseren.....	do.	do.	Do.
Formaggio della paglia.....	Soft	Gras	Do.
Battelmatt.....	Firm	do.	Do.
Appenzell.....	do.	do.	Do.
Gessenay.....	do.	Maigre	Do.
Cristallin.....	Hard	Gras	Do.
Vacherin.....	Firm	do.	Do.
Bellelay.....	Soft	do.	Do.
Valais.....	Firm	do.	Do.
Praetigau.....	Hard	do.	Do.
Vaud.....	Firm	Maigre	Do.
Tomme.....	do.	do.	Do.
Schubziger.....	Soft	Gras	Do.
Bocler.....	Firm	Maigre	By sour milk.
			Do.

A *fromage gras* or cream cheese is of unskimmed milk; *maigre* of skimmed milk; *mi-gras*, of partly-skimmed milk.

B.—Analysis of Swiss Cheese.

Component parts.	Emmenthal.	Gruyère.	Bellelay.	Gessenay.	Vacherin.
Water.....	34.92	34.57	37.59	12.40	27.21
Fatty matter.....	31.26	29.12	30.05	31.35	45.87
Caséine.....	29.88	32.51	28.88	46.80	25.29
Salts.....	3.94	3.80	3.48	6.45	1.63
	100.00	100.00	100.00	100.00	100.00
Fatty matter.....	41.1	47.3	51.	42.4	51.8
Caséine.....	48.90	52.7	49.	57.6	48.2
Total.....	100.00	100.00	100.00	100.00	100.00

C.—Exportation, in metric quintals, of Swiss cheese, 1810 to 1880.

[The metric quintal = 100 kilos.]

Year.	Metric quintals.	Year.	Metric quintals.	Year.	Metric quintals.
1810.....	6,000	1866.....	125,522	1874.....	204,326
1825.....	10,000	1867.....	148,386	1875.....	198,631
1830.....	73,395	1868.....	141,869	1876.....	200,967
1861.....	81,428	1869.....	162,446	1877.....	177,950
1862.....	80,620	1870.....	169,890	1878.....	195,799
1863.....	83,608	1871.....	206,707	1879.....	210,171
1864.....	92,717	1872.....	192,715	1880.....	217,189
1865.....	126,807	1873.....	196,026		

D.—Importation and exportation of cheese, 1877 to 1880, in metric quintals.

Year.	Importation.		Exportation.	
	Quantity.	Value.	Quantity.	Value.
1877.....	q. m.*	Fr.	q. m.	Fr.
1878.....	13,684	2,189,600	177,990	32,038,200
1879.....	13,371	1,871,040	195,799	31,327,800
1880.....	12,112	1,574,560	210,171	31,520,100
	13,251	1,723,020	217,189	31,730,210

* Metric quintal = 100 kilos.

G.

28.

atter.	Coagulation.
.....	By rennet.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	Do.
.....	By sour milk.
.....	Do.

of skimmed milk; mi-

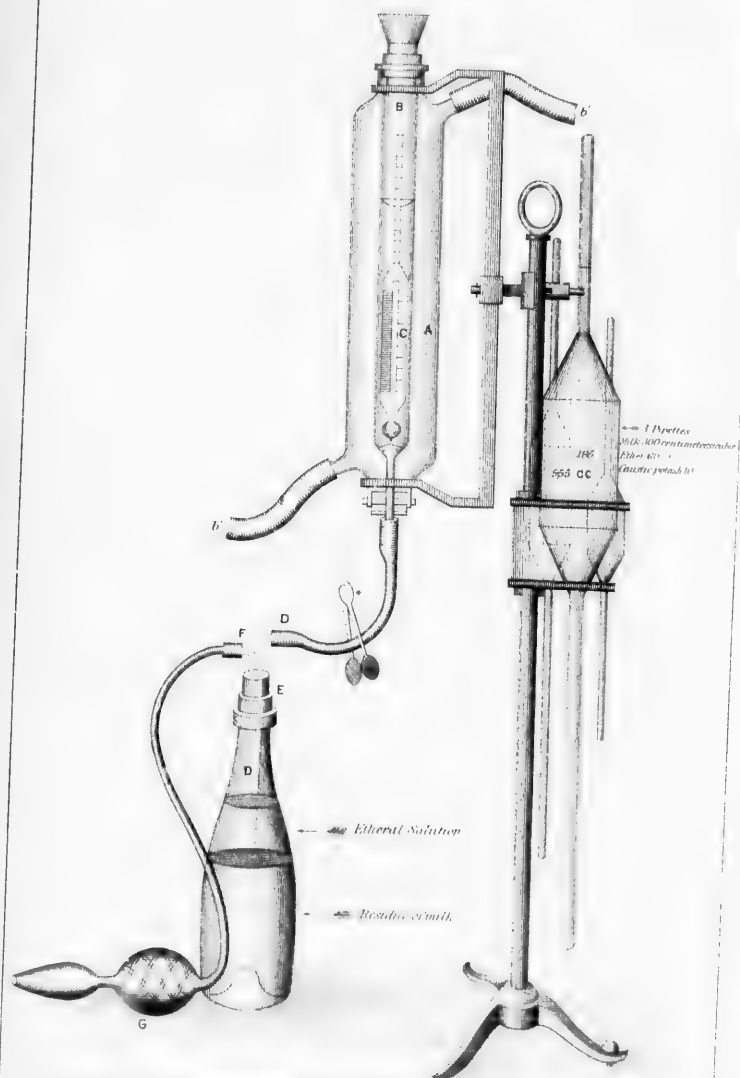
ay.	Gessenay.	Vacherin.
59	12.40	27.21
05	34.35	45.87
88	46.80	23.29
48	6.45	1.63
00	100.00	100.00
	42.4	51.8
	57.6	48.2
00	100.00	100.00

1810 to 1880.

Year.	Metric quintals.
.....	204,325
.....	198,631
.....	200,967
.....	177,900
.....	195,799
.....	210,171
.....	217,189

metric quintals.

Exportation.	
Quantity.	Value.
<i>q. m.</i>	<i>Fr.</i>
177,900	32,038,200
195,799	31,327,800
210,171	31,533,100
217,189	34,730,200



A. Glass tube filled with water by inserting *b* in the water and suction of hand then stopper at *a*.
 B. Inner tube in which the aerometer floats in the Etheral solution pumped up from the bottle through *D*, and there retained by pulling on the upper *a*.

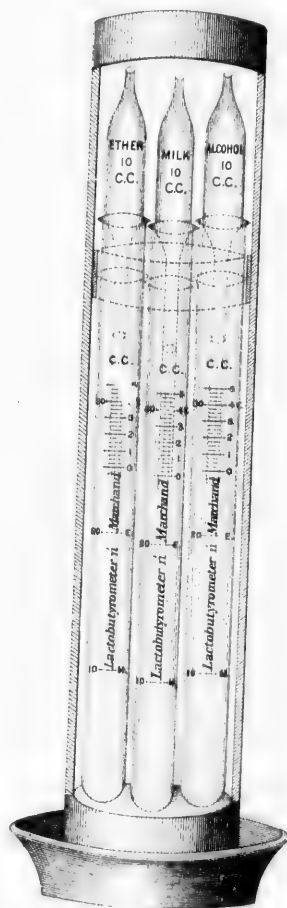
PROFESSOR SOXHLET'S AEROMETER FOR EXTRACTING FAT



— 1 Dyette
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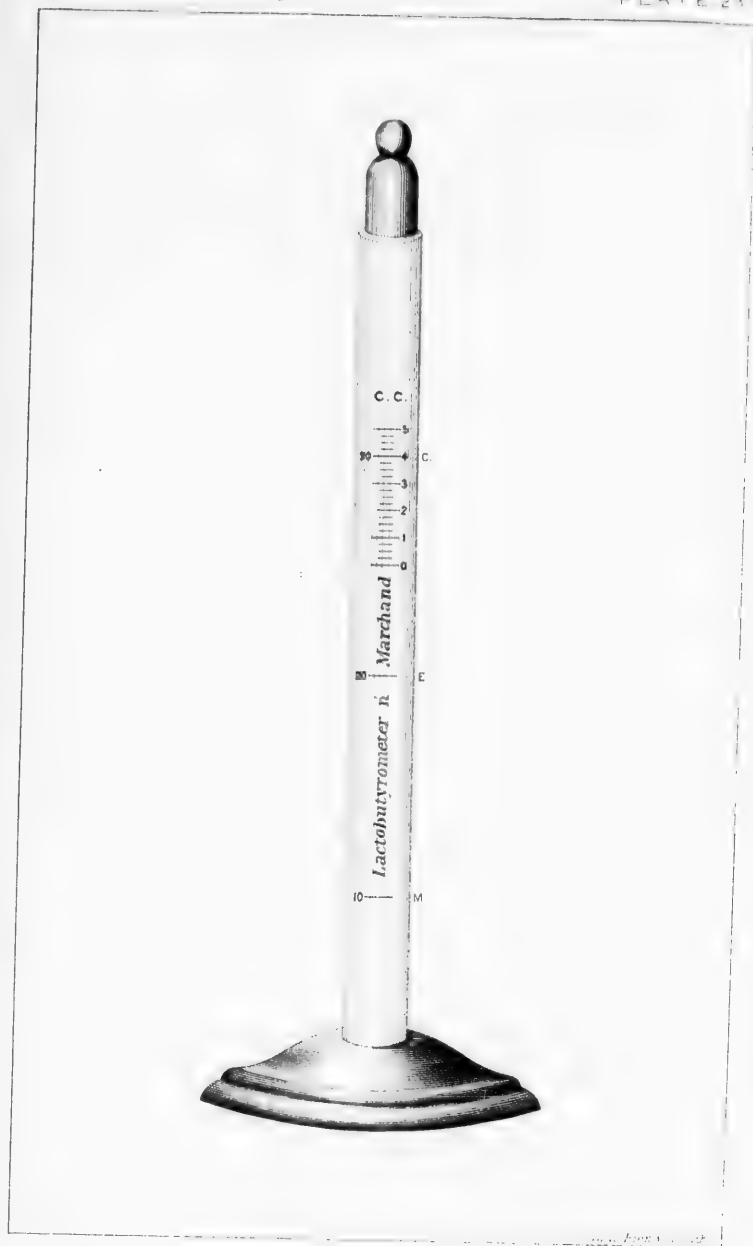


COPPER BATH SHOWING 3 PIPETTES

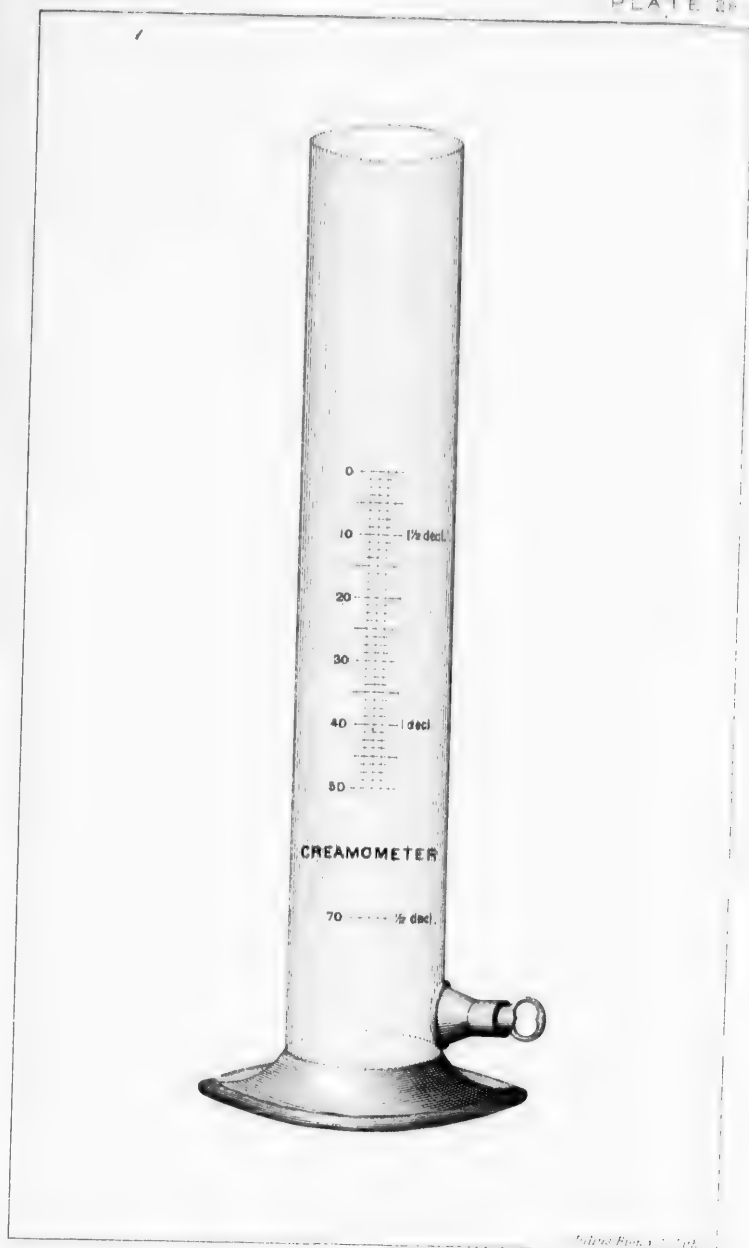
PLATE 283



FESER'S LACTOSCOPE



LACTOBUTYROMETER ON STAND WITH STOPPER

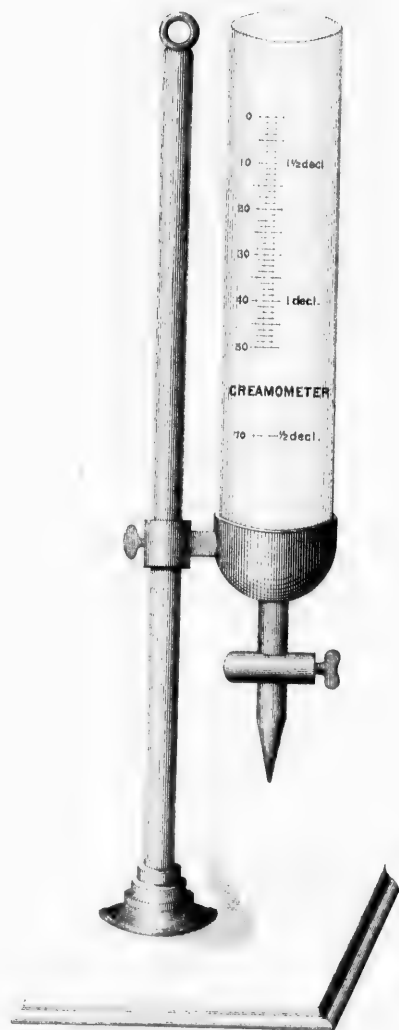


GERMAN CREAMOMETER OR CREAM TESTING TUBE
WITH BOTTOM OUTLET

PLATE 21

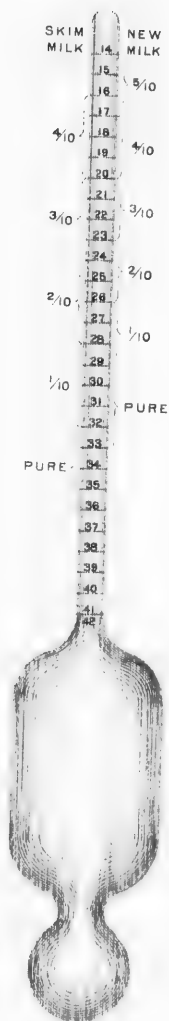
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TUBE



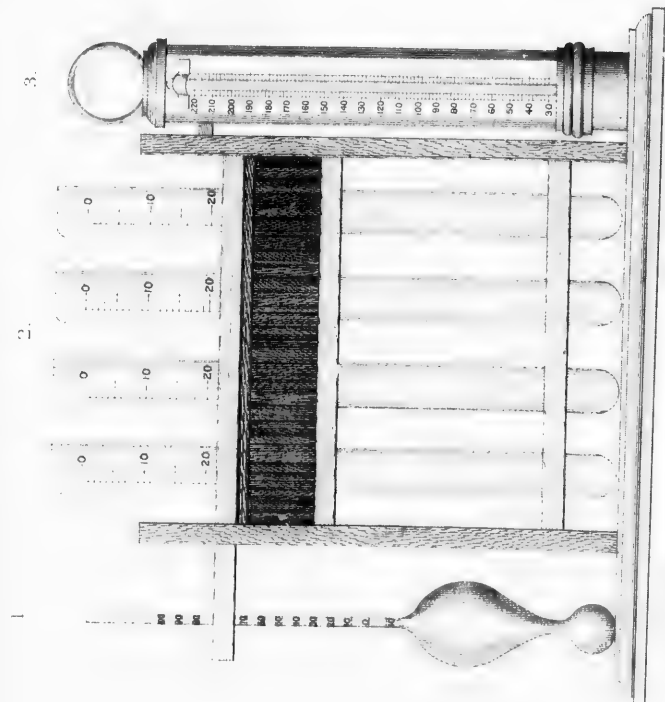
CREAMOMETER ON STAND

PLAT 27



QUEVENNE'S ORIGINAL LACTOMETER
OR LACTODENSIMETER.

PLATE 2-4



The black space is a slide for writing down the cream test.

MILK TESTING SET

REPORT

Milk
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Vevey
Yverde
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Payern

F.

1851...
1852...
1853...
1854...
1855...
1856...
1857...
1858...
1859...
1860...
1861...
1862...
1863...
1864...
1865...

E.—Prices per 50 kilos of different varieties of Swiss cheese from 1851 to 1880.

Year.	Emmenthal	Gruyère de Montagne.	Gruyère de la plaine.	Spalen.	Year.	Emmenthal	Gruyère de Montagne.	Gruyère de la plaine.	Spalen.
	Francs.	Francs.	Francs.	Francs.		Francs.	Francs.	Francs.	Francs.
1851.....	52	42	40	35	1866.....A.....	56	49	45	50
1852.....	48	40	38	35	1867.....	66	48	53	48
1853.....	52	46	45	37	1868.....	71	59	57	61
1854.....	56	47	45	39	1869.....	75	60	57	69
1855.....	58	51	49	40	1870.....	66	62	59	71
1856.....	57	50	48	41	1871.....	77	67	66	57
1857.....	61	53	51	49	1872.....	85	71	70	67
1858.....	62	54	53	51	1873.....	93	74	73	77
1859.....	66	54	55	49	1874.....	75	60	53	78
1860.....	70	54	52	50	1875.....	90	62	60	59
1861.....	57	51	52	49	1876.....	90	79	78	69
1862.....	56	51	47	53	1877.....	90	76	77	82
1863.....	67	53	50	54	1878.....	76	62	60	60
1864.....	68	59	59	57	1879.....	75	63	63	60
1865.....	65	53	54	56	1880.....	85	79	78	73

F.—Highest quotations of cheese in different Swiss markets per kilo for October, 1880.

Markets.	Fromage gras.	Fromages maigre.	Markets.	Fromage gras.	Fromages maigre.
	Francs.	Francs.		Francs.	Francs.
Morges.....	2.00	1.20	Neuchâtel.....	2.00	1.40
Nyon.....	2.00	1.30	Sion.....	1.30	0.90
Vevey.....	2.40	1.60	Geneva.....	2.20	1.25
Yverdon.....	2.00	1.10	Fribourg.....	1.90	0.40
Monthon.....	2.00	1.40	Bulle.....	1.75	1.10
Payenne.....	2.00	1.50	Delémont.....	2.00	1.50

LYELL T. ADAMS,
Consul.

UNITED STATES CONSULATE,
Geneva, November 25, 1881.

SCIENTIFIC DAIRY INSTRUMENTS.

REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

Milk testers are not particularly numerous; indeed, it is questionable whether an absolutely perfect instrument can be devised inasmuch as specific gravity, as well as the cream test has proved inefficient when used alone. The use of the lactometer, creamometer, and thermometer in combination, however, are found to be very sure tests; and although, in cases of prosecution, analysis is resorted to yet in private practice, the above will answer every purpose. Cream is measured in a glass tube called a cream-gauge or test-tube or in a glass jar and called a cream measurer or creamometer. The lactometer is really a hydrometer adapted by a modification in its scale to test the density of milk instead of the density of water—in like manner as by other modifications suited to the requirements of the various liquids, separate forms of the hydrometer are made and known by the names of alcohometer, saccharometer, &c. In the accompanying illustration the lactometer is on the left hand, and a set of test-tubes or creamometers are between the lactometer and thermometer.

The lactometer (called the "lactidensiméter" or "épreuve" on the Continent) is used for gauging the density of milk. It was invented by M. Quevenne, a medical man in Paris, and is now in general use, although the scale differs in various countries. It is similar to an ordinary hydrometer, and is furnished with a scale, which shows the density of the milk at a glance. A given volume of water weighing 1,000 pounds, is no larger in

The black space is a state in waiting down the cream used

MILK TESTING SET

bulk than a similar volume of milk weighing 1,029 pounds to 1,033 pounds, according to its quality; and, bearing this in mind, Quevenne taking off the ten, used the other two figures upon his lactometer. His scale commences at 11, which is at the top, and descends to 42 at the bottom. It is apparent that 14 (otherwise 101.4) is far too low to be pure, but the margin is a wide one, while 42 (1042) is just as much the other way.

When the instrument is placed in the milk (which should be done very gently, in order that it may not sink, and cause milk to adhere to a point above that at which it floats, or it will not be true), the figure which is level with the surface will show the true state of the case. Thus, in Quevenne's, if it rests between 29 and 33 it is pure; if between 27 and 29, $\frac{1}{10}$ water has been added; between 24 and 26, $\frac{2}{10}$; if between 21 and 23, $\frac{3}{10}$; and so on. A sketch of this instrument is shown.

With English lactometers the scale commences at the bottom at 10, goes up to 0, and then up to 100, at the top. Pure milk marks 0, pure water 100; thus every figure between shows the actual adulteration, the ten spaces below 0 indicating when milk has been skimmed. These lactometers are usually employed in milk heated to 60° Fahr., while the Quevenne is used at 59° Fahr. (15° centigrade and 12° Reamur).

An advantage of Quevenne's scale is that it tests skimmed milk as well as whole milk, the same figures being made to apply by being bracketed; thus 33 to 36 indicate purity, and skim milk being heavier than new milk, the lightest portion, cream, being skimmed from it, while the addition of water is shown between 32 and 17. There is no doubt that Quevenne's instrument acts well when used for mixed milk; but it often varies considerably with the pure milk of individual cows.

In using the lactometer it is best to have a deep and narrow glass vessel, similar to a creamometer, in which the milk is poured at the right temperature. When the instrument is placed in the milk, it must be held by the stem until it floats at the right mark; that it be not made too heavy, as mentioned above. If it sinks below the pure-milk mark the percentage of watering may be suspected. Thus, supposing the lactometer to be an English one, measuring 0 to 100, if one-half the liquid be water and the other half milk, it will sink to 50; if 20 per cent. of water is added, it will sink to 20, and so on.

It must be remembered that the lactometer can not be expected to do more than it professes; it denotes the gravity of milk, and if that gravity is anywhere near the average, all well and good; but, as the milk of different cows varies in gravity, so does the instrument cease to be a specific guide when applied to these distinct samples. If in testing a sample it is found lighter than the average, there is reasonable suspicion that it has been watered; if, on the contrary, it is found heavier, there is ground for believing that it has been skimmed.

The English lactometer shows this on the scale 10 to 0. It has been shown that inasmuch as cream, like water, is lighter than milk, a sample heavy in cream would appear to be adulterated just as though it had been watered; while, on the other hand, if salt or sugar were dissolved in the milk, they, being heavier, would cause it to show that, to all appearance, the milk had been skimmed. Thus it is always well to use the creamometer and lactometer in conjunction with each other, so that when both point to watering or skimming there is little doubt of the fact. Again, it is well to use the creamometer even when the lactometer is satisfactory, for it can be cheated. As has been shown, if water is added to milk it is made lighter, and that if skimmed it becomes heavier from the loss of its lightest constituent; it is therefore possible to first skim it and then bring it back to its normal gravity by the addition of water. Although the lactometer would not detect this, the creamometer would.

It was found by Chevalier, by experiment, that the value of the glass creamometer is much regulated by its diameter, in accordance with its height. In using it the milk is poured in until it reaches the top line, 0°, and left for twenty-four hours in a room at about 60°, by which time it will have formed a cream of 7° to 25°, according to its richness. This instrument is valuable, as shown above, for use in conjunction with the lactometer, and also for testing the cream yield of individual cows. By its special feeding may be tested, and thus considerable expense saved. It must not be inferred that the quality of the cream is shown by the creamometer, for cows giving the same quantity often make less butter than others. At the same time the cream test by this plan is a very valuable one.

The thermometer is a most necessary instrument in the dairy, as without it the work is accomplished by guess; and in spite of those who prefer to trust to their innate knowledge of temperature, there is no doubt that the result affects the quality of both butter and cheese very materially.

A lactoscope was recently invented by Professor Feser, of Munich, which is based upon the measurement of the degree of transparency of milk, which depends chiefly on the fat it contains. The instrument consists of a graduated tube, marked with a double scale, and a pipette, which is filled with the milk to be tested. This is then poured into the large tube, when water is added until the black lines are visible. The percentage of fat

to 1,033 pounds, according off the ten, used the at 14, which is at the top, wise 1014) is far too low as much the other way, done very gently, in order ve that at which it floats, ve will show the true state 33 it is pure; if between if between 21 and 23, 161

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ch, which is based upon pend chiefly on the fat ed with a double scale, is then poured into the The percentage of fat

will be shown. The lactoscope is a very ingenious instrument, and is in use at the Cham laboratory, Switzerland, where the chemist had made a more perfect instrument after Feser's model; but, although ingenious, it is not perfect.

A German gentleman, Dr. Heeren, has invented an instrument which he calls a "pioskop," from "pios," fat. It consists of a small round disk of india-rubber, in the midst of which there is a circular raised ring, and a glass disk of the same size, also divided by a ring in the middle, the outer part of the disk being divided into six equal parts, and colored from white into shades of blue, up to dark blue. The white signifies cream; the light blue, very fat; medium blue, normal; a deeper shade, less fat; deep blue, thin milk; and blackish blue, very thin. In working a few drops of milk are placed into the inner part of the india-rubber disk; the glass disk is next placed on the top, so that the transparent part is on the top of the milk. The milk thus squeezed changes to one of the colors named above, and thus indicates its quality. Its price is 1s. 6d., and is sold by Beinbauer, of Hamburg.

An instrument called a "testing centrifuge" was recently invented by the Rev. H. Round, of Worcester, Mass. It is practically as correct in gauging the cream which is contained in milk as the creamometer, but, unlike the latter, it does its work at once and more completely. It is also believed to be a better test of the available cream in milk than analysis, because the latter gives the total butter fats, all of which have never yet been obtained by any practical method of cream separation.

There is one more experiment which is easily performed with milk, viz, the separation of the fat, and which a little practice will enable a person to do for himself. The instruments required are a proper tube, a copper bath for the same, and a thermometer; also, some ether and alcohol, both of a given strength. The tube is divided into three parts, the top division being also graduated. First, new milk is poured in and up to the bottom line, when the ether is added to the middle line, and severely shaken until complete amalgamation has taken place. The alcohol is then added to the top line and also amalgamated by shaking, a most important point. The tube is then placed in the bath of water at 100° Fahr., and allowed to stand until the preparation of the fat is complete, when it can be measured by the gauge at the top. For ordinary purposes there is no better system for testing the butter-making properties of a cow.

For the estimation of the fat, however, which is contained in milk, Professor Soxhlet has invented an apparatus which is most valuable, and the best yet made for such a purpose. By the illustration it will be seen that the stand, which is a metal one, has a holder fitted with a movable screw for holding the glass tube A, to the projecting tubes of which the india-rubber tubes *b b'* are attached. In the center of *a* is fastened a smaller tube of glass, B, the top of which projects beyond *a*, and is closed by a cork. The diameter of B must be two millimeters greater than that of the float of the areometer. The areometer has a scale divided into degrees corresponding to the specific gravities, and these again are divided into halves. In the float of the areometer is fastened a thermometer, graduated. An india-rubber tube connects the bottom of B with the glass tube at D, which passes through the cork E of the bottle, which is designated the agitating bottle, and the glass tube F, to which is attached a pair of small hand-bellows, likewise passes through the cork. The stand also holds three pipettes for the measuring of the milk, ether, and caustic potash. The caustic potash solution must be of 1.26 to 1.27 specific gravity, which may be prepared by dissolving 400 grams of fused caustic potash in half a liter of water, which, after cooling, is made up to one liter. The ether must be saturated with water, and this can be obtained by shaking commercial ether with $\frac{1}{16}$ of its volume of water at the ordinary temperature. A large vessel of at least 7 pints capacity filled with water at a temperature of 17° to 18° C. is also required.

To perform the experiment, the milk, after having been thoroughly mixed, and at a temperature of 17° to 18° C., 200 cubic centimeters are measured by the largest pipette and discharged into one of the agitating bottles, which should have a capacity of 300 cubic centimeters. Similarly 10 cubic centimeters of the potash solution are measured and discharged into the bottle containing the milk, and mixed; 60 cubic centimeters of ether saturated with water are then added. The ether when measured must be between 16° to 18° C. The bottle is then closed, well shaken for half a minute, placed in water at a temperature of 17° to 18° C., and shaken every alternate minute for a quarter of an hour. After this it stands for a quarter of an hour (although it sometimes takes a longer period), when a layer of the ethereal solution of fat is seen on the top, which must be perfectly clear. The india rubber tube at the bottom of *a* is then placed in water at 17° to 18° C., when *a* is filled with the water by suction, and closed by connecting the ends *b b'* with a small glass tube. The stopper of the bottle is replaced by the cork E, and the tube D is so inserted as to dip nearly to the bottom of the clear ethereal solution. The cork at the top of B, and the nippers, H, being opened, a quantity of ether, sufficient to cause the areometer to float, is forced by means of a gentle pressure of the hand bellows into the tube B, when the clamp is closed and the cork inserted into B, to

prevent evaporation. The position of the scale is then read off, that part being read off which coincides with the middle part of the deepest curved line on the surface of the liquid. The temperature during the estimation of the specific gravity of the solution must be noticed, and if it is $17^{\circ}.5$ C. the specific gravity will need no further correction, for it must be understood that it is diminished by a higher and increased by a lower temperature. The temperature of the water in A may fluctuate from $16^{\circ}.5$ to $18^{\circ}.5$ C., and the specific gravity of the ethereal solution at $17^{\circ}.5$ C. having been found, the amount of fat in weight per cent. can be obtained from the table supplied with the instrument. The value of the Soxhlet apparatus is that the percentage of fat to the second decimal place is obtained, thus making it as valuable as actual analysis.

CREAM-SEPARATING MACHINES.

REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

Up to the present time the most popular machine in England and France has been the De Laval, which is the only one that has been regularly exhibited. There are two reasons for its popularity—its price, which has varied between £30 and £37, and its value—for it is a good machine. Perhaps it also ought to be said that it has no opposition in either country, for this is almost the fact. True, three other machines have been exhibited in England; but in one case, the "Danish," patent difficulties have prevented its sale; in another, the "Lefeldt," is very much more expensive; and in the third, the "Petersen," a quite new machine, which competed at the Royal last year against the Laval for a gold medal. It was far higher in price, suitable only for big dairies and factories, and did not take off all the cream. There is, however, a difficulty with the Laval, which its inventor can not overcome; it requires a great deal of power for so small a machine, and it cannot be made in smaller or larger sizes, these being most insuperable objections when rival machines are introduced without them.

The De Laval is the invention of a Swede of that name, but it is not the earliest invention, for centrifugal force, which is in reality forced gravitation, as applied by an English inventor, was first used by a German, Professor Fuch, as early as 1859. In Laval's machine the receiver revolves with the milk some 5,000 times a minute and takes the cream from some 200 quarts an hour. This receiver, which is made of steel, works upon a vertical axis, and is filled with the milk through the medium of a funnel which passes into it from above. As the milk revolves, the centrifugal action causes the lighter cream to gather at the top in the center, while the heavier portion of the volume is forced to the outside. This being the case it only needs some additional outside power to force it outside and this is provided by the continual stream of new milk. The result is that the heavy skim milk is compelled to find its way through a tube to an outer chamber whence it runs out by a pipe. As the new milk enters and is skimmed the enlarged volume of cream likewise demands an outlet, for it cannot get to the periphery nor escape with the milk; hence it is provided with a special tube and chamber, and escapes from another portion of the machine in a similar way. As the drum is 11 meters in diameter, the surface speed of the interior required to separate the cream is about 15,000 feet per minute.

Now we will take the Danish machine, originally so called, although now that there are not one but four or five machines made in Denmark, we ought to follow the example of the Danes themselves and use the names of the makers; otherwise buyers will some day get into a difficulty. This machine, called, respectively, the Petersen and Burmeister & Dam, is sent out by H. C. Petersen & Co., Copenhagen, which fact should be specially noted, as of the eight machines we know four are made by different firms of this name. So far, this is without doubt the best machine which has yet appeared. It is an open, flat-topped, horizontal drum, which must be fixed upon a solid foundation and can be worked by one or two horses or by steam power. The drum is about 21 feet in diameter, or 15 inches across the open space, while the depth is 2 feet. In the center is a cone, within which is the shaft by which the machine is worked. On the top or ledge of the outside drum is an apparatus invented by Professor Fjord, of Copenhagen, and into this the milk runs as it comes from the vat; here are a set of strainers, and in each corner tubes so arranged that just as much milk can be passed through as is necessary. Each tube extends to very nearly the floor of the drum; it is bent at the end so that as the milk leaves it it runs directly onto the periphery. When the drum is in motion—and it revolves only 1,800 times a minute—the body of the milk is whirled round, and immediately becomes a wall lining the periphery of the drum. As in the

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DE LAVAL'S SWEDISH SEPARATOR

Wm. Petersen & Co.

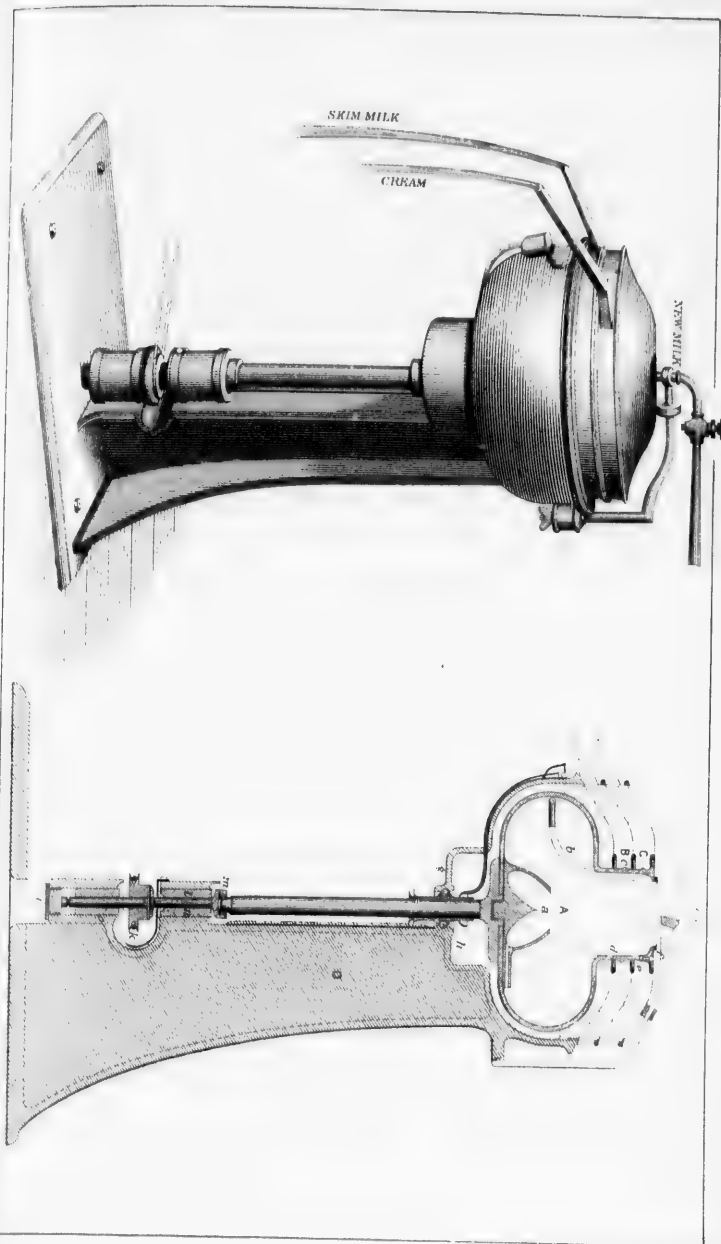
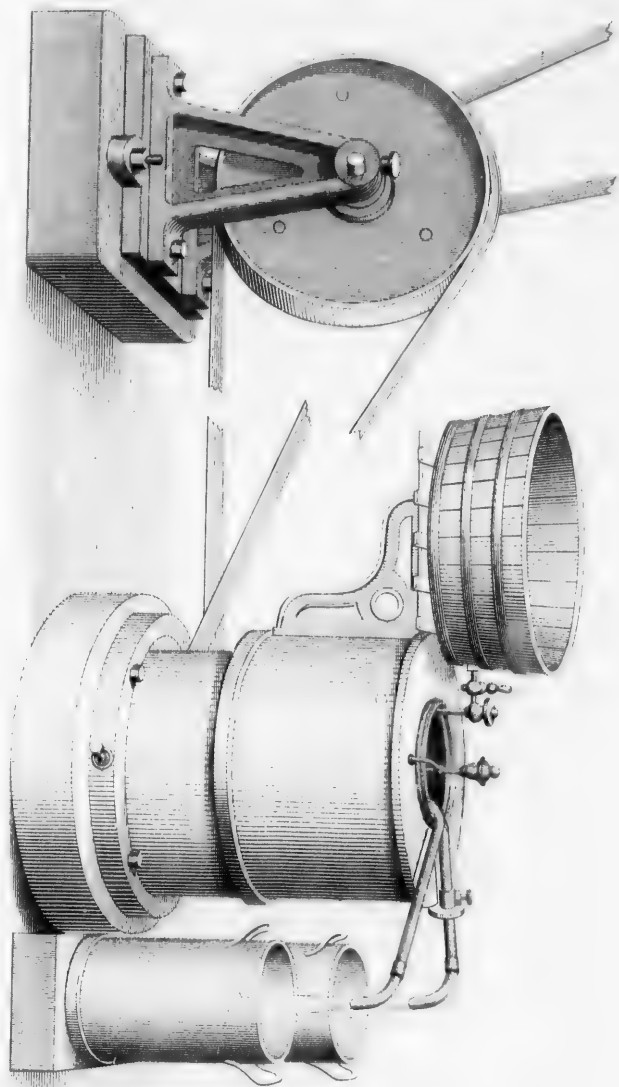
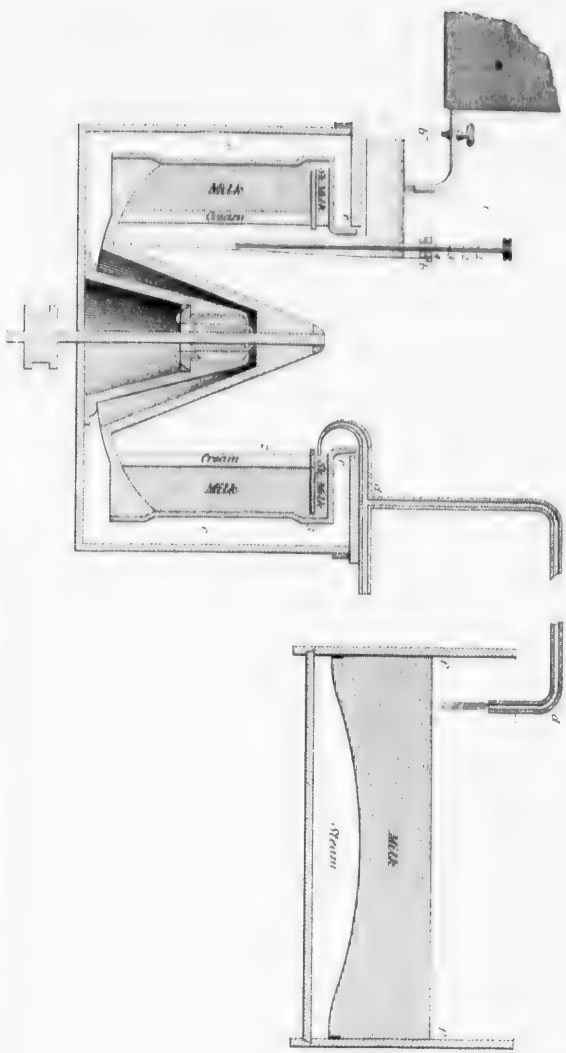


PLATE 231



1. LEJORD'S REGULATOR

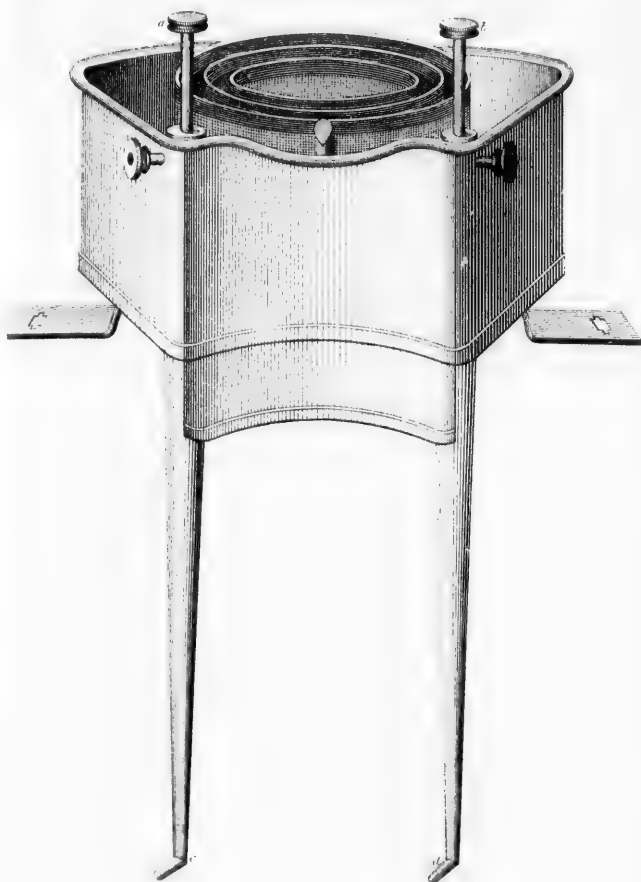
2. FLOODE (CREAM)



When the machine provides the cream, it is the surface, and the skin will pass inside the small opening at the top of the vessel, of the cream.

1 FJORD'S REGULATOR 2 FLODE (CREAM)

Notes: Fig. 1, 170



NOTE: This is fixed upon the Danish Separator; the long tubes a & b reaching to the bottom of the drum. The milk falls into the center of the 5 sieves or strainers and is passed into the machine in turn in small quantities as the stoppers c & d are revolved, thus allowing the cream to rise from the milk.

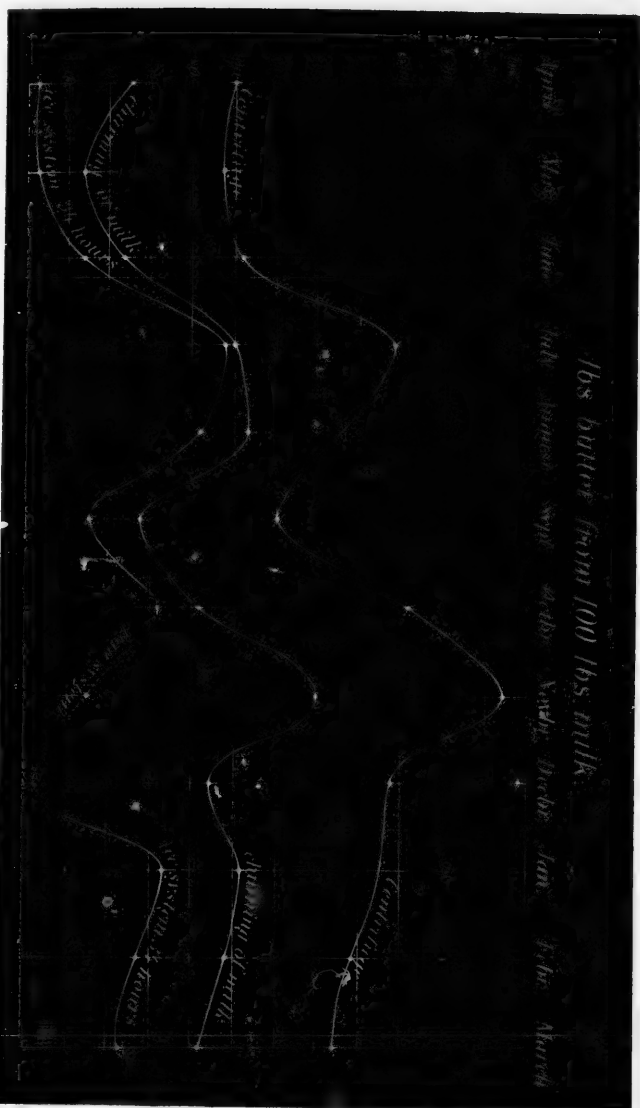
Patented Sept. 10, 1890

PROFESSOR FJORD'S REGULATOR

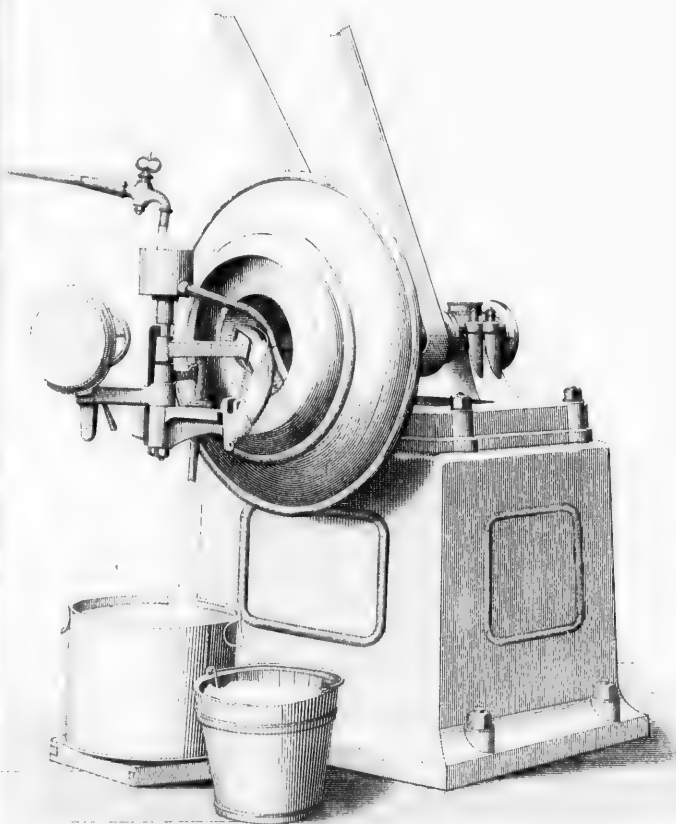
BY THIS MACHINE ANY PERCENTAGE OF CREAM
CAN BE SKIMMED BY THE DRAIN

SCALE SHOWING THE VALUE OF EACH SYSTEM.

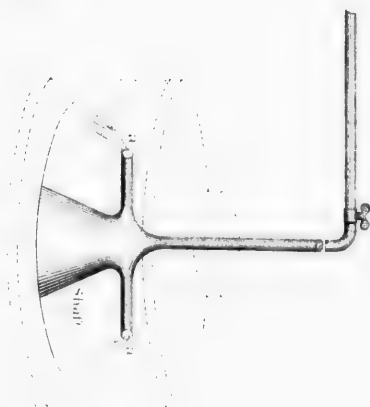
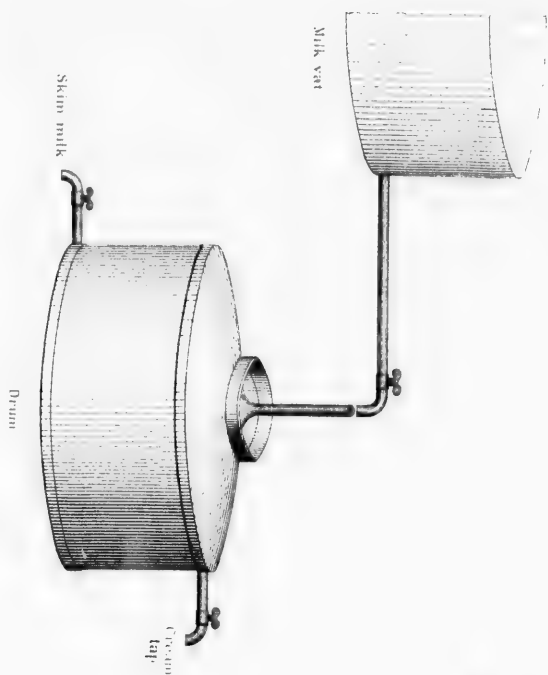
Value Range & Co. Ltd.



SCALE SHOWING THE VALUE OF EACH SYSTEM.



THE VERTICAL DRUM CREAM SEPARATOR
OF PETERSEN OF HAMBURG



a a This view illustrates the mode in which the interior of the Drum is divided

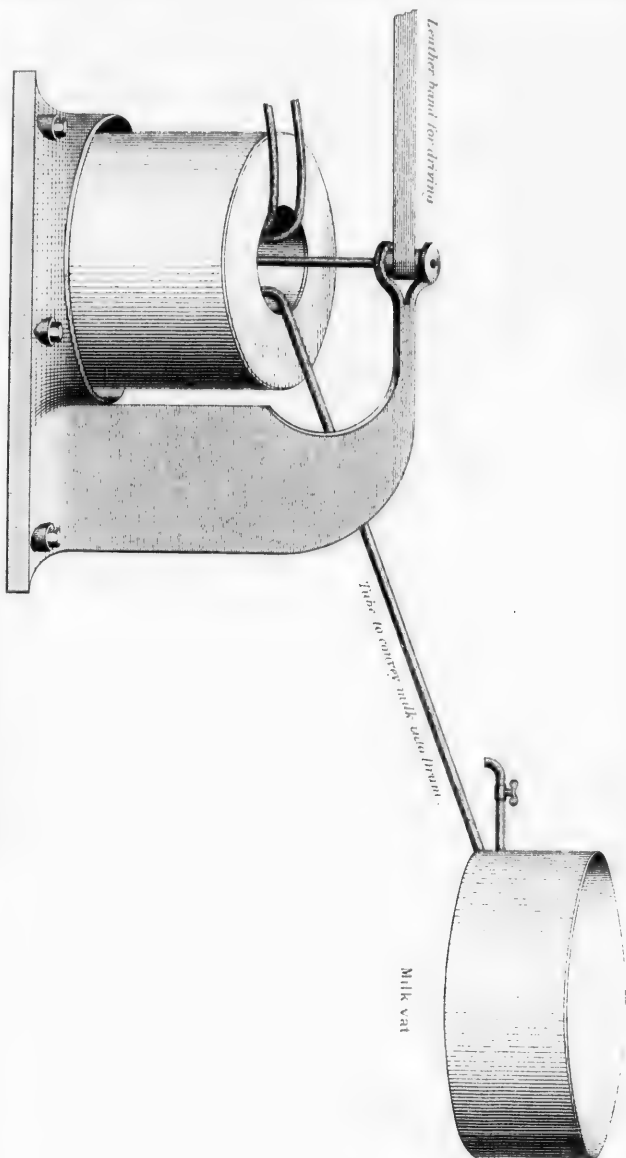
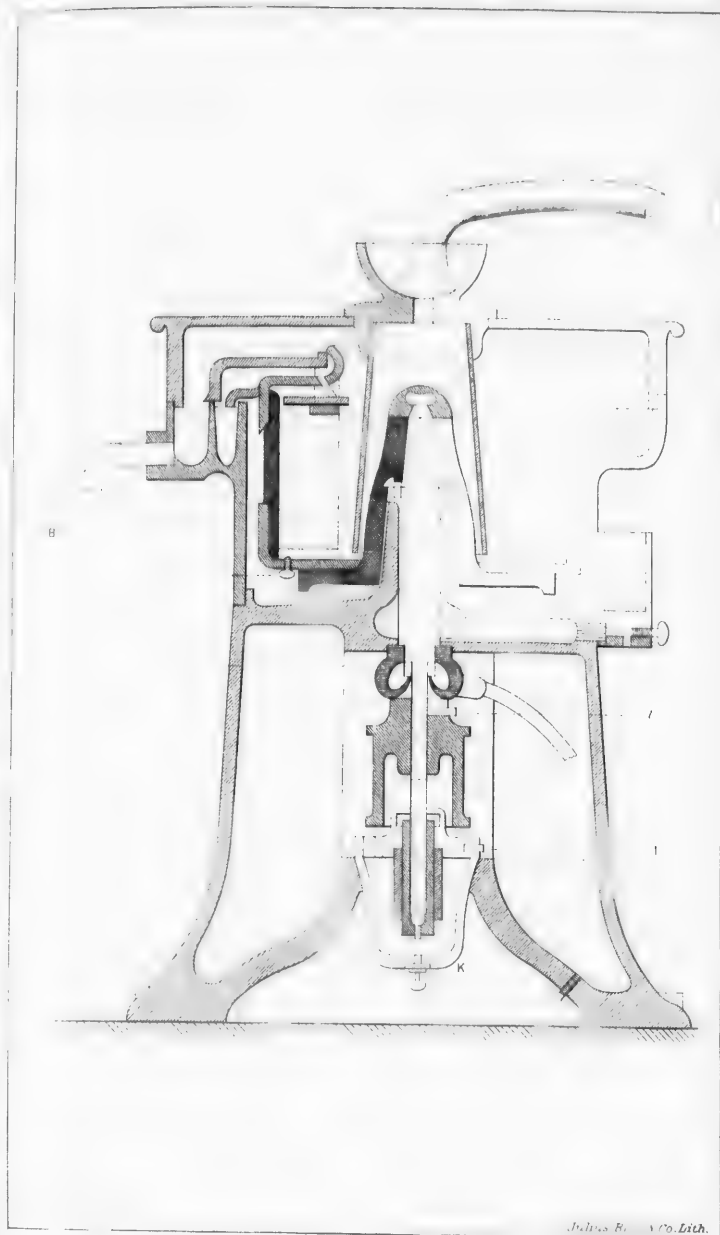
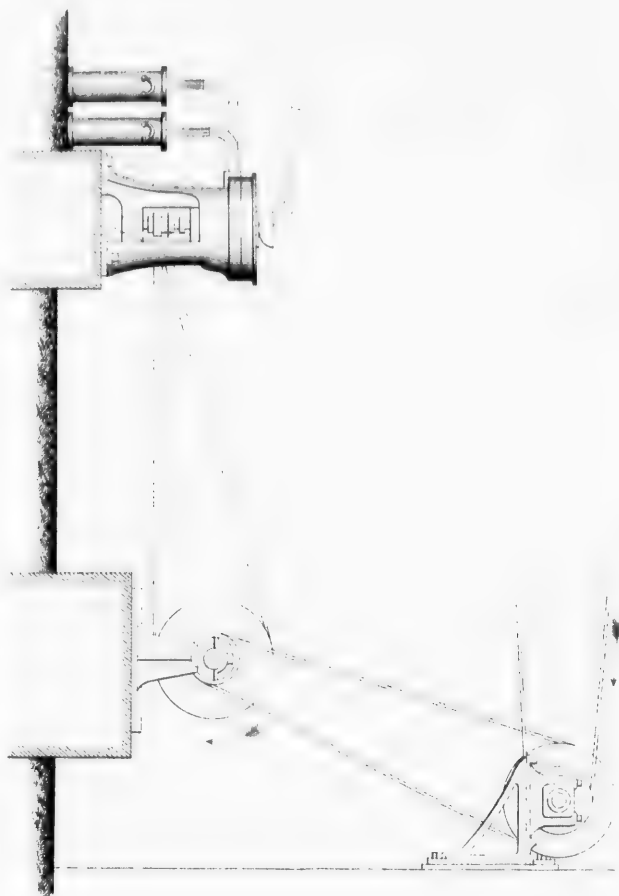


Figure 1. A milk separator, showing the shaft and the speed.

MILK SEPARATOR



THE ELDON CREAM SEPARATOR.



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De Laval, centrifugal force brings the cream to the surface and to the top, where it is met by a sharp tube, fixed from the outside and literally cut off, the tube acting like a plane and making a furrow into which the band of cream rushes only to be cut off the faster. It rushes down this tube and out into the pail set to catch it. As the milk continues to be poured in and the cream to be cut off, the skim milk at the back is forced through an outlet at the top into a little chamber above the cream, where it is taken by a cutting tube in a similar manner.

With regard to Professor Fjord's apparatus, it may be mentioned that if all the cream were required, a plain tube only would be necessary; but as different milk producers and dealers have their own ideas, they must be consulted. One may wish to make cheese, and leave a portion of the fat in the milk; another may prefer to sell skim milk which is still rich in cream, for there is no denying the fact that this separator takes more cream from it than can be obtained by any old system. For this end, then, Fjord's regulator is used, and by its aid any proportion of fat can be taken. Thus if the supply be increased by regulating the tubes, the skimmer will only take the same quantity of cream, consequently more must be left in the milk.

The last addition to this machine is an ingenious machine by which the revolutions are counted, and this does Mr. Peterson, who is really the inventor of the machine, great credit. This gentleman claims to skim with his large machine 1,200 pounds or 120 gallons an hour. This statement is not an exaggeration, for, when in Sweden, the manager of a large factory, where the centrifuge is worked, in answer to a question told us that he separated 200 Swedish cans an hour, this can being 6 pounds. The cream, too, can be taken of any thickness, so that indeed a spoon will stand upright in it.

The large machine costs 1,100 kroner Danish, or about £60, while the smaller is 650 kroner, this revolving nearly 2,800 a minute, skimming nearly 600 pounds of milk, and working by one horse. There is also a tube which will carry the skim milk away overhead into a vat, instead of into a pail below. It should be mentioned that in all cases the temperature of the cream and the quality of the milk has much to do with the results, and to this end it is now the custom to heat all milk to its temperature on leaving the cow by passing it over hot water or steam tubes as it runs into the machine.

In comparing this machine with the Laval, we find, first, that it requires less power and does more work, its surface speed being 9,750 feet, or 5,250 less than the Laval. It can be had in almost any size, and can be regulated. At the Royal trial it gave more butter, while the analysis showed—

Component parts.	Laval, 20½ gal- lons per hour.	Danish, 43½ gal- lons per hour.	Skim milk.	43½ gallons.	52½ gallons.
Water.....	61.46	52.32	91.72	91.82	91.86
Fat.....	33.44	42.68	.29	.11	.44
Casein and sugar.....	4.56	4.42	7.22	7.32	7.41
Mineral.....	.54	.68	.77	.75	.79
Total.....	100.00	100.00	100.00	100.00	100.00

During the past year the most important contest which has yet taken place was held at the Danish Exhibition in Aalborg where prizes were offered for large and small separators. The Danish of Petersen easily won in the large class, two of his machines competing, one running at 1,900 and the other at 2,100 revolutions per minute, the indicated horse-power being 1.3. In the small class the jury selected the Danish and the Laval for trial at a farm-house under the superintendence of Professor Fjord. Everything was done which science could devise to make the experiment complete. Every minute during the trials the speeds of the axle, of the horse gear, of the vertical axles, of the separators, of the rotary dynamometer, and of the intermediate motion, were written down by self-registering indicators. The Danish gave a speed of 2,400 to 3,000 per minute, and the Laval 5,600 to 7,000, the result of the five series of experiments which were made being that where both separators were driven by the same power the Danish skimmed 565 pounds (Danish pound is equal to 1.12 pounds English) per hour, leaving 20 per cent. of fat in the skim milk, and the Laval 450 pounds per hour, leaving 24 per cent. in the skim milk; or, in other words, it was shown that at the same degree of skimming and with the same supply of milk the Laval required one-third more power than the Danish, or, supposing that the same power is consumed, the Danish small

machine skimmed one-third more than the Laval. When the supply of milk was the same and the consumption of power also the same, the Laval left 64 to 65 per cent. more fat in the skimmed milk. Under these circumstances the Danish machine took the other gold medal.

Now we may refer to the Lefeldt, which is the oldest machine now in use, and which, like the above machines, has been recently improved. In appearance this machine is not unlike the Laval, but is more expensive. It was first produced by Willy Lefeldt, a civil engineer of Schöningen, Brunswick, who at the polytechnic school at Carlsruhe, had, it may be supposed, seen something of the invention of Professor Fuchs in that town; and in 1874 he produced the first machine which was shown at the exhibition at Bremen. The Lefeldt revolves at the rate of 2,400 upon a vertical shaft driven by bands attached to two disks, the one on a level with the machine and the other above it. The cream is taken on a principle similar to the De Laval, but the machine is much more elaborate. It is made in three principal sizes, thus: the one for separating, 400 litre (88 gallons or about 900 pounds); the price is 500 marks, or with the fixtures, £32; for 1,000 litre it is £75, and 2,000 litres £125, without fixtures. The inside diameter of the drum is 24 inches; thus the velocity required to separate the cream from the milk is 15,072 feet per minute, or a trifle more than the Laval. There is no doubt whatever of the value of this machine, for we have seen it working in Switzerland at the great Anglo-Swiss works, where it is much appreciated, as well as in Germany, and the only fault found with it is that it has now and then to be stopped.

The machine "System Heinrich Petersen," of Hamburg, while working under centrifugal force, is quite unlike those above mentioned. Instead of horizontal drums and a vertical shaft it has vertical drums and a horizontal shaft, the drums being also very different in form; the diameter is large and the depth very little. Instead, too, of the circumference being flat it forms an acute angle. The shaft is fixed to an iron foundation, the drums being on each side, and when there are two used they resemble a couple of carriage wheels upon an axle. The shaft is driven from above, and the milk, which is poured into the drum from the front, is skimmed from the same position, and the bystanders can see the whole working. If, for instance, the finger is introduced and touches the surface of the milk as it revolves, it will almost be cut with the force of contact, but here a large cutting tube is introduced and takes off the cream similarly to the other systems, the skim-milk being forced into the outer chamber of the drum and also skimmed. This machine is now improved, and can be regulated to take any quantity of cream by screwing the cutter deeper into the cream, as is found necessary. The drums are made in various sizes, but are decidedly dear—the small-drum machine, holding 100 pounds milk per drum, skimming 600 pounds an hour, costs £75; if two drums are purchased then the cost is £126 5s. A 200-pound drum machine, to skim 800 pounds an hour, costs £95, or for two drums, skimming 1,000 pounds, £160. These machines do an immense amount of work, have great advantages on account of the power used and the possible addition of drums, but are too dear.

The "Nakskov," which has never been seen in England, is a Danish machine, made by Tuxent Hammerich, of Nakskov, and resembles the Danish or Bernmeister in a great measure. We saw it at work at the exhibitions in Denmark and Germany, and we must say it did its work well, although it is a palpable copy, but without an analysis of the skimmed milk we should not like to say that it took all the cream. It has no regulator or machine to count the revolutions, and works on a shaft from above, which is fixed to a powerful bent iron arm which comes from the foundation and over the back of the drum, which is 22 inches in diameter, with a smaller opening than the Danish (9 inches). It is driven from a horizontal wheel or disk, and it is claimed to separate 350 to 400 pounds of milk per hour, the cost being £27 10s.

Another machine, called the "Aarhus," made by Jansen, of that town, is priced £34, and is also similar in appearance in all respects, although the working is a little different. The milk enters the machine through a tube fixed in the top of the upright shaft, and a little below this becomes two arms, each of which distributes the milk into the periphery. Here, too, is an arrangement for the escape of the milk at the bottom, the cream being taken at the top. The drum of this machine is similar to a plain round vat. At the top is a wire gauze strainer, from the tube on the top of the shaft is filled. The annexed drawing will show the system of the distribution of milk. The top outside pipe is for the escape of the cream and the bottom for the escape of the skim-milk.

Another machine is manufactured by O. C. Petersen & Co., of Copenhagen, but this did not compete in the trial, having arrived too late. The makers informed us that its price was to be 300 kroner, or about £16 10s, but although there appears to be some merit in it and a considerable amount of merit in the price, it is hardly perfected; yet the makers are in the hope of quickly placing it upon the market.

Again, another separator was entered by O. Petersen & Co., of Roskilde, but this not being perfected was not sent, although it also has some merit, but its price is consider-

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The last machine exhibited was called the "Solid," the invention of Hervis S. Berglund, a Swedish engineer. This is priced at 450 kroner.

I give sketches of the Danish, the Laval, the Lefeldt, the Petersen (Hamburg), the Nakskov, and the Aarhus; the last two being rough sketches made in Denmark by the writer.

A. WILTSHIRE DAIRY.

STATEMENT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

The following table gives a record for seven years of the receipts in a Wiltshire dairy of English crossbreds:

Year.	Average number of cows in milk.	Number of days cows were milked during year.	Total yield of milk.	Average annual yield of milk per cow.	Milk sold.	Cheese sold.	Butter sold.		Average price of milk, per gallon.	Average price of cheese, per cwt.	Average price of milk butter, per pound.	Average price of whey butter, per pound.
							Milk butter.	Whey butter.				
1881.....	70	308	<i>Galls.</i> 31,634	<i>Galls.</i> 454	<i>Galls.</i> 8,534	<i>Tons, cwt.</i> 8 5½	<i>Cuts.</i> 40	<i>Cuts.</i> 5½	<i>d.</i> 9	<i>s.</i> 58	<i>d.</i> 13	<i>d.</i> 12
1880.....	70	308	26,386	7,960	7 15	34½	5½	9	32	14½	11	11
1879.....	70	308	30,513	436	3,450	12 18	36½	5½	9½	44	16½	12
1878.....	70	308	31,153	445	3,840	12 10½	43½	6½	9½	59	16	12
1877.....	72	308	28,470	395	1,790	11 11½	42½	6	10	60	17	12
1876.....	80	308	32,930	411½	150	13 4	34½	5½	12	55½	16½	11
1875.....	70	308	24,270	346½	90	10 10	28	4	12	66	16	10

DAIRY ASSOCIATION LAWS OF WÜRTEMBERG.

[Inclosure in Consul Catlin's cattle report.]

Statutes of the Dairy Association at Heidenfingen (Registered company).

1. The undersigned associate themselves together for an indefinite period under the title of the Registered Dairy Association of Heidenfingen.

The seat is at Heidenfingen, and its object is a most advantageous disposal of milk by a joint management of the business.

2. Only persons who are of age, self-supporting, and of good character, and who own milk cows in their own right, can become members of the association.

3. Membership is acquired by signing the statutes or a written declaration of accession, after having received formal admission from the general assembly.

4. The membership is annulled (a) by voluntary resignation, (b) by death (c) by expulsion.

A resignation can only take place at the end of a business year; the declaration of withdrawal must, however, be sent in to the president of the association at least three months in advance, otherwise a discharge from membership can only ensue at the end of the following year.

In case of death membership ceases on the day of death; it may, however, be transferred to the widow or heirs of the deceased member, who can carry on the business, without any entrance fee, if such privilege is applied for within one week after.

Withdrawal is made by approval of the general assembly, in which case the membership ceases on the day of the approval. Expulsion must be acted on as soon as a member has lost the capacity to serve or his standing as a citizen; it may, however, also ensue through a non-compliance with the duties provided for by the statutes.

5. The settling of the accounts of those who may have withdrawn from membership (4 a, b, and c) or of their heirs takes place at the end of the business year. Their balance is, however, not paid over before six months. Also for two years from the day of cessation of membership ex-members are liable for their share of any losses by the company.

6. Members have the right—

(a) To take part in the general assembly and to vote there. This right ceases with the day of declaration of resignation. Female members have neither the right to vote nor admittance to the assemblies.

(b) To forward to the dairy all milk which they produce and to claim their payment monthly for the same from the company.

(c) To draw their share of profits on the basis of section 30.

(d) At any time to enter the dairy and take note of the conduct of its business.

7. Members are required—

(1) To pay an entrance fee of 10 marks, which sum forms at the same time their share in the capital stock without interest. On withdrawal from the company (4 a, b, and c) this sum is repaid.

(2) To observe the existing regulations and subsequent resolutions of the association, as well as to guard the interest of the company in all respects.

(3) To be individually responsible with their whole property in so far as the property of the association may be insufficient to meet its obligations.

(4) To forward daily a stated quantity of milk, which quantity shall be fixed by the superintendent in each case, in proportion to the number of the cattle; and particularly to acquiesce in the following rules relative to the delivery of the milk:

(a) The milch cows are to be well and regularly fed, as well as thoroughly milked. The udders are to be washed before milking if necessary; care must also be taken that there be sufficient straw and pure healthy air in the stable.

(b) The milk is to be delivered immediately after milking in a clean vessel, which must be properly cleaned after each time it is used, and must not be used for any other purpose.

(c) It is forbidden to deliver the milk of cows which are diseased at the udder, or not in good general health; the milk of fresh milch cows in the first five days after calving; the milk of bearing cows in the last four weeks before calving; the milk of cows newly brought in from market and which have not been previously three times milked; thin and poor milk, and in general all milk which in any of its conditions is not normal.

(d) At any discussions arising relative to the quality of milk, the areometer of Müller and the creamometer of Chevalier are to be applied as tests, and each member must hold himself subject to the decision resulting therefrom.

The milk is to be considered thin, when its specific weight—measured at 15° Celsius by the areometer of Müller—falls under 1,029, and it is to be considered as devoid of fat, when, after twenty-four hours of skimming, it yields less than 10 per cent. of cream, according to Chevalier's creamometer, at a temperature of 10°–15° Celsius.

(e) All milk which is intentionally altered by the owner to the prejudice of the association (skimmed, watered, &c.) is considered adulterated. If adulteration is proved, the furnisher has for the first offense to pay a stipulated fine of 100 marks, and in case of repetition is to be expelled from the association. Should there be any suspicion of adulteration of milk, the superintendent is to examine into the matter, and if necessary to cause a chemical investigation of the milk. He has also the right at any time to have the cows of the milk furnisher milked in order to compare the milk obtained in his presence with the milk furnished.

8. The association is to conduct its business independently with equal rights to all its members. Its directors are the executive committee and the general assembly.

9. The committee consists of the superintendent of the association, a vice-superintendent, an accountant, and two inspectors. The general assembly holds two separate elections annually, at the first of which the superintendent, and at the second the other four members are chosen. These officers are eligible for re-election.

10. The committee distribute the business among its members according to its own judgment. The vice-superintendent and the accountant are to be chosen from among its members.

11. The committee is responsible to the general assembly for its action. Its members are personally answerable for all losses resulting from negligence or malfeasance, and may for this reason be released from their duties at any time.

12. The executive committee assembles as often as the superintendent finds it necessary, or upon the request of two of its members.

13. The business of the executive committee is: (a) The discharge of current business; (b) the arrangement and care of the books; (c) the directing and paying of the cheese-maker and all hands required in the business; (d) the purchase of the necessary fuel and other articles required in the dairy; (e) the rendering of the yearly accounts and the taking of the inventory.

14. To form a quorum of the executive committee the presence of at least three members is required. In case of a tie the president has the casting vote. Every subject of discussion must, if two members of the committee desire, be laid before the general assembly for decision, and in this case a special meeting of the general assembly is to be called. The proceedings of the committee are to be recorded.

15. The executive committee represents the association in all legal proceedings, and signs for it. The signature is valid in the name of the superintendent or the vice-superintendent and one other member of the executive committee under the title of the association. The legitimization of the executive committee is made by a certified extract from the record of its election and that of the vice-superintendent.

16. The superintendent, in addition to the other duties imposed upon him by the orders of the executive committee and the general assembly, is required: (a) To issue calls for the meetings of the committee and general assembly, to preside over the same, and to take care that the resolutions there adopted are carried out to the letter; (b) to have an oversight of the buildings and all movable effects belonging to the association, which he, according to the inventory, has under his charge; (c) to order as often as possible examinations of the milk, to watch over the employes, and to hold at least once a year a special revision of the accounts; (d) to announce immediately to the committee any irregularity in the books or business in order that measures may be taken tending to the safety and surety of the association.

17. The accountant, who at the same time acts as bookkeeper, if the committee does not decide otherwise, has charge of all the funds of the association and keeps the books as to income and outlay according to his acquaintance with the business. Payments from the treasury of the company can only be made by written order from the superintendent or the vice-superintendent and some other member of the committee. He must allow at any time a revision of books to be made by the superintendent.

18. The call for the general assembly, which has the final decision in all the affairs of the company, and which is issued by the superintendent, must be made in writing, and not later than three days before the holding of the same, with mention of the matters to be discussed.

19. The regular general assembly, at which the yearly accounts are to be rendered, with a report of the examination of the same, as well as the election of the new committee and the auditors of accounts must take place not later than the end of February in each year. Special general assemblies can, in cases of emergency, be called in at any time; the superintendent is obliged to call them if the committee decides, or if a third of the members propose it, with a written statement of the subjects to be discussed.

20. At the elections each member has one vote, and it is not transferable. The election of officers, as well as the votes on receiving or excluding members, must be done by written ballots. On any other questions members may vote by rising from their seats, or remaining seated, provided that the general assembly may at any time decide upon another mode of voting.

21. Besides the cases mentioned in section 32 the general assembly is at any time qualified to decide whether the call has been regularly issued, with a mention of the subjects to be discussed.

22. Decisions are binding for all members of the association, if they are taken by vote of a plurality of members present. In case of a tie, the vote of the president decides.

23. The general assembly has the right to withdraw the privilege of presiding officer from the superintendent on any proposition brought before it, and to offer that privilege to any other member of the association.

24. Minutes are to be kept of all decisions, and these minutes, after having been read and adopted, are to be signed by all the members of the executive committee.

25. All subjects not expressly appertaining to the executive committee must be submitted to the decision of the general assembly.

26. The necessary funds for carrying out the objects (§ 1) of the association are to be raised (1) by admission fees, (2) by mortgage, (3) by fines and other payments.

27. The fiscal year is identical with the calendar year. At the end of the year the committee shall settle its accounts and take an inventory. The balanced account for the year is to be forwarded for examination to the auditors of accounts not later than the end of January, and is to be placed before the regular general assembly not later than the end of February with a report of the results.

28. The yearly account must include: (1) All income and outlays; (2) a special account showing profit and loss; (3) the balance showing the assets of the association at the close of the year.

In the latter are to be mentioned, under *active capital*: (1) the condition of the Treasury in ready money; (2) the securities actually in hand quoted at their market value; (3) money collectible except that not bearing interest and that of which the probable value cannot be estimated with any certainty; (4) the actual dairy products and other

stores according to the price of the day; (5) all other movable effects, with a statement of their value after deducting at least 5 per cent. for wear and tear; (6) all fixtures according to their cost (provided the general assembly does not decide otherwise); (7) all interest-bearing debts only collectible in the next year's accounts.

Passive capital.—(1) The members' shares in the business; (2) the reserve-fund; (3) debts on capital; (4) unpaid bills; (5) expenses yet due and unpaid (income, wages of hands, &c.); (6) interest yet due, but not payable before the next year's account, reckoned to the end of the year.

The surplus of the active over the passive capital constitutes the net profit, the surplus of the passive over the active the net loss.

29. Any possible loss is covered by deduction from the reserve-fund. Should the latter not prove sufficient, then the members are to bear the deficiency in proportion to the measures of milk delivered during the year passed and to pay in the amount in cash.

30. The profits are to be applied as follows: (1) A sum in marks equal to the number of hectoliters of milk delivered to the dairy during the previous year shall be applied to cancelling borrowed capital and to the formation of a reserve-fund; (2) the remainder shall be distributed among the members pro rata, according to the quantity of milk delivered; (3) when all capital debts shall have been paid and when the reserve fund shall have attained the amount of 1,500 marks the net gain shall be distributed to the members pro rata as above mentioned.

31. In order to prevent a loss in the yearly accounts, milk should not be paid for higher than at 8 pfennig per liter.

32. In voting upon amendments to the statutes or the enacting of new ones, as well as upon a dissolution of membership, the presence of at least two-thirds of all the members is necessary in the general assembly, and at least four-fifths of those present must vote affirmatively to render such action valid. If the dissolution of membership is decided upon, then the property remaining on hand after deducting the debts, will be paid over to the members in proportion to the quantities of milk delivered by each member to the dairy during the last two years. The same rule is applicable to the payment of debts. The liquidators are to be chosen by the General Assembly.

33. All disputes concerning decisions under these as well as future statutes of the association shall be acted upon by the general assembly. No member is allowed to waive this, and the law has no voice therein.

34. All publications of the Association shall be made in its firm name and over the signature of the superintendent, in the newspaper published at Heidenheim, entitled the "Grenzboten," also in the Württemberg Weekly Journal for Agriculture.

35. In questions not provided for by these statutes, the German Association law shall decide.

TRANSPORT OF CATTLE.

REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

Inquiries under this head have been made of every firm of shippers to America in England, but the great majority have nothing to do with the transport of live-stock. Particulars, however, have been obtained from some firms which will be found of considerable value, but it appears that the general arrangements of fitting stalls, feeding, cartage, and minor matters are usually left to and made by independent persons of whom, so far as can be learned, only one, Mr. Sherlock, of 9 Canning Place, Liverpool, is regularly engaged in the business and able to give specific information. There are other persons who undertake this work but only in a casual way, as they may be employed by breeders, or dealers in cattle in their particular districts. Some persons make their own arrangements and send stock men across the Atlantic whom they have themselves selected for the work. Mr. Sherlock's particulars, however, will be found most valuable, and the account he annexes will be a good guide to intending shippers. There is not always the necessity for engaging any particular firm unless the number of animals to be sent is large; for if the British exporter is an intelligent and careful man he can surely be trusted to manage this without the additional expense of an agency.

The writer has himself exported to America and found little or no difficulty in the matter. Communication was made with the shipping firm who forwarded information as to the time when the cattle were to arrive and where they were to be sent. They were fitted with specially-made halters, insured, and victualled with an ample quantity of food. They were then met at the station, conducted to the vessel, and placed under the care of one of the men on board who was allowed for the purpose and used to the work. In such a case the vessel is watched from the other side, and the animals taken

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MR. JAMES LONG, OF

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The Cunard Company (Limited), of Liverpool, furnish the following particulars: Ship-
pers of British cattle to America should be careful to select the largest type of vessel,
with high 'tween decks and good speed. The animals should be berthed on the main
deck, under a spar-deck (never exposed to the weather), where there is a certainty of ven-
tilation. The owner's own servants take the care and management on the voyage and
providing the food. The ship finds fittings and water. The cost of the freight will de-
pend upon the season of the year, as, according to the British passenger acts, the number
of steerage passengers in the vessel is limited by the number of cattle carried. Up to
March and after July freight can be obtained at a cost of from £8 8s. to £12 12s. per
head, according to the number. Shipment is generally effected by the animals walking
on board (which is a great advantage over being slung), and the discharge in the same
way. The trade is greatly hampered by the enforcement of quarantine by the Ameri-
can Government on healthy and unhealthy animals alike.

Messrs. George Warren & Co., of Alexandra Buildings, James street, Liverpool, state:
The freight on horned cattle from Liverpool to Boston ranges from £3 to £5 per head,
according to the number shipped. For single beast of high value £10 10s. has been paid,
the shipper taking all risks of the voyage. The fittings, food, and attendance are found
by the shipper, and therefore we cannot give you any information on this point, but we
would refer you to M. Sherlock, esq., Canning Place, Liverpool, who has frequently
shipped sheep, cattle, and horses.

Mr. Sherlock has furnished the following information: I have thought it best to
give a memorandum showing the expenses incurred on shipment of two horses in
May, 1885. I have discarded odd money, but have given sufficient in order to enable one
to gather some information. I have been shipping cattle, horses, cows, and sheep for
over twenty years. I shipped three or four herds of Guernseys, some valuable horses,
and two lots of sheep lately; and with my experience, therefore, I am in a position to
give considerable information. My greatest feat was the purchase and shipment of
sheep in 1882, assisted by a retired farmer. We selected thirty-seven rams of six different
breeds, and shipped them. This year, 1884, we purchased ninety-nine ewes for the same
parties, viz. "the Massachusetts Association for Promoting Agriculture," and they were
so pleased with what we had done that they sent me a very handsome present.

The insurance against the total loss of the steamer is trifling—same rate as on ordinary
goods—but against accident, either in shipping, on board, or on landing, it runs very
high, sometimes as high as 10 or 15 guineas per cent. We have always victualled for
twenty-five or twenty-eight days, according to the season of the year. Such may seem
absurd, but it is on the safe side. Cattle steamers coming to Europe have nearly always
something on board upon which they can fall back, such as grain, Indian corn, flour, &c.,
but outwards there is nothing of the kind.

Again, as to the man in charge of the animals, we have two or three first-class men,
men who are constantly crossing with cattle, and they frequently call in to know if we
have anything going. These men, being good sailors, do not suffer from sea-sickness,
and consequently can always be at their post. Five pounds is the general payment. I
find we disbursed nearly £700 for the last lot of sheep—ewes. I have only lost one horse—
a large, heavy stallion—which, however, was no fault of mine, as he was of a fretful tem-
perament, and very shortly after a gale of wind sprung up he died. The following is the
memorandum above referred to:

Expenses of the shipment of two horses in May, 1883.

	£	s.
Freight out, £10 10s. each	21	0
Groom's passage	4	0
Victuals for twenty-five days: 732 pounds hay, 168 pounds straw, 2 sacks saw- dust, and sacks	4	0
300 pounds crushed oats, 260 pounds bran, 10 pounds linseed, sacks &c.	3	0
Cabbage, carrots, and turnips, or roots	10	
Ironmongery: Fork, bucket, scraper, basket, comb and brush, &c.	15	
Stalls, very strong, padded, with mangers, &c.	5	5
Sings, extra strong	2	10
Leather halters and ropes	10	
Incidental expenses: Livery stables, groom's board and lodging, men leading to stables, and next day to steamer (4 miles), cartage, portorage, provender to the dock, men at steamer assisting in shipping, &c.	3	10
Consular invoices (breeding purposes), 5s., say; consular fee, 15s.	1	0
Entry at customs, dues, bills of lading, and insurance (against total loss of ship only, and not against accident)	1	0
Agency: Attendances, fixing steamer, and freight at dock, and stalls, superintend- ing shipment, early or late, from	£3	3s. to 4 4

Messrs. Flinn, Main & Montgomery, the managing directors of the Mississippi and Dominion Steamship Company (Limited), of Harvey Building, 24 James street, Liverpool, state that the rate of freight averages from four to five pounds per head, which includes the cost of the stalls and fittings used on the steamer and the supply of fresh water during the voyage. Fodder and attendance are provided by the shipper, and an attendant is allowed free for every 25 cattle. As to cost of maintenance during the voyage, Messrs. Flinn, Main & Co. are unable to give any certain information. The loss from mortality by this company's vessels is very slight. Out of 1,343 head of prize breeding stock carried to Quebec during the summer of 1883, only 4 died, and during the winter months they have been carried with equal success.

The stalls are placed on the main-steerage decks. Their average size is, for a single horse, 8 feet by 4 feet, such stalls being always padded. Cattle stalls are constructed so that each shall hold two animals, and their size is usually 8 feet by about 5 feet 6 inches. These are the ordinary sizes, but special arrangements can be made to have the stalls arranged for any particular lot, as shippers may desire. For shipping by this company's line, or in fact by most of the Atlantic lines, the Alexandria dock station of the London and Northwestern Railway Company is the most convenient, and cattle should be sent forward the day previous to the ship's sailing date.

NOTE.—For convenience, wherever pounds, shillings, and pence occur the pounds may be reckoned at \$5, the shillings at 25 cents, and the pence at 2 cents.

BRITISH CATTLE MARKETS.*

REPORT BY CONSUL RYDER, OF COPENHAGEN.

The attention of the Royal Agricultural Society of Denmark having frequently been called by many of the district members to the great want felt by the agricultural classes for full and trustworthy information on this subject, it was determined by that society in the course of last year to send over a duly qualified expert to examine closely into the workings of the English markets, as well as into the general requirements of the trade, and the results of this official's investigation have now been made public for the benefit and guidance of the agricultural community.

In furtherance of the objects in view two market places in London, two in Newcastle, and one in Edinburgh and Glasgow were visited, and it is remarked in the outset with much truth that in order to obtain a proper insight and become fully acquainted with the systems of these markets, to which are forwarded a large number of cattle of considerable money value from this country, it was first of all felt to be of primary importance to seek for full information regarding the different classes of customers at these markets and the demands made by them, as constituting one of the essential points of investigation.

At Newcastle the markets were found to be held on Mondays and Tuesdays of each week, on the first day the market being held in the cattle stalls; on the second in the open market place. On the Monday the buyers were traders from distant places, viz, from Manchester, York, Leeds, from the borders of Scotland, and even from London. From Manchester, which has a cattle trade of equal importance as London, come the largest number of buyers: wholesale dealers who purchase in large lots, never less than a railway-wagon load, and, as a general rule, nearly half the cattle is bought up for that trade center. Though Manchester, from its adjacent position to Liverpool, the chief receiving port of the United States imports, this market of Newcastle is always greatly influenced according to the extent of the American imports. On the Tuesday, on the other hand, the market is generally attended by the local butchers, as also by the butchers from the neighboring towns in this thickly populated district. Tuesday may thus be regarded as a day of retail trade, inasmuch as each butcher only buys a couple or at most from six to eight head; but on this day there is generally a very brisk trade, a large number of beasts are disposed of. Finally, there is a third class of buyers, but these are more uncertain in their dealings, namely, the traders from London, so-called cayo butchers, who look out for the large and coarser kinds of animals, to sell these again to the great sausage manufacturers.

In comparison with Newcastle the London market ranks poorly in regard to the numbers of customers for the Danish cattle. The chief buyers in this market are the wholesale butchers from the western part of the city, the Whitechapel butchers, who buy up a fair amount of these cattle, one individual taking at times from one hundred to one hundred and twenty head in the week. These purchase the inferior, large-horned animals, but at the same time require them to be of a perfectly sound condition. They purchase

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chiefly for the Jewish population, who buy the forequarters, whilst the hindquarters are sold in the meat markets.

Another class of customers are the country butchers from Kent. These buy the large animals of best quality, especially young and fat heifers. Individually they do not buy in large quantities, but still the number sold to them on the whole is far from inconsiderable. The third class of London customers are the large meat contractors for the army and navy services, the hospitals, &c. These are, however, a class of buyers of very uncertain nature, inasmuch as they can often remain away for a lengthened period of time; but then when they do make their appearance they can purchase on a very extensive scale; frequently a couple of thousand head, one individual contractor having been known to purchase twenty-two hundred beasts in the course of two days. They are, in consequence, held in dread by the other classes of customers, whilst they are, on the other hand, most heartily welcomed by the commission agents. This class of customers as a rule confine their purchases to beasts of somewhat inferior description. Finally a fourth class is to be found in the retail butchers, of which there are a large number; but these, unfortunately, it would seem, are, with great difficulty, reached by the importers of Danish cattle. They dwell chiefly in the eastern quarters of the town, and only buy animals of best quality, but, as before said, they are very difficult to approach, and when they do come to our agents they only buy of the very best, and, on the whole, do not seem to favor our cattle, but prefer keeping themselves to their home breeds.

To the market of Edinburgh, or, one should rather say, Leith, which is the port of entry, and suburbs of that city, comparatively few, and all lean, cattle are sent from this country, and it may be said that this market has never met with much success. The trade is here, for the greater part, carried on at public auction, held in a large building belonging to the commission agents, who are mostly moneyed men and few in number, and the market would almost appear to be greatly ruled by some of the leading men.

The system of auction may undoubtedly be equally as advantageous as that of selling by lots, nevertheless it is the general opinion that the prices in the Edinburgh market were more fluctuating than in the others. Both in the Newcastle and London markets the supplies have increased enormously in the last ten or eleven years. In the year 1872 there were imported into Newcastle from foreign lands 96 head of cattle; in 1878, 28,990 head; in 1880, 55,800 head, and in 1883, 104,300 head. It cannot therefore be a matter of surprise that under so rapid development a system of conducting the trade should have arisen which should not be allowed to exist.

Several bad customs have crept in which are now difficult to combat, but which may ultimately prove of serious detriment to the trade unless a firm stand is taken in time against them. For example, it is now of very common occurrence that the commission agent, so as not to cause dissatisfaction to his constituents when he has made sales at low prices, is in the habit of adding to the price at his own cost, whilst on the other hand he makes a deduction from the prices obtained when he has succeeded in effecting sales at unusually favorable rates. Again, these agents frequently have their subagents in the kingdom, to whom they make a pecuniary return for each animal which is forwarded to them through their influence, and which must in the long run come out of the pockets of the farmers. Another objectionable practice is that of long credits too often given by the commission agents in order to secure customers, but which can at times be the means of entailing loss to the farming classes at home; and again, the large advances which are also frequently made by these agents to cattle dealers in the kingdom (the middle men) are likewise the means of creating an amount of uncertainty in the trade. These large advances too often lead to extensive speculations being carried on, which in a great measure place the farming classes at the mercy of these traders. These middle men again are also too often in intimate connection with the forwarding steam company's agent.

All these excrescences only tend to injure the vitality of the trade, and in all probability the only correction against such abuses will be found in "combinations" by the farming population to protect their interests, as also by transacting their business with agents of their own choice.

Another great factor in regulating the state of the English markets is to be found in the different relations with our competitors in the trade. The nature of this competition is to be seen from the imports from the different countries. Thus the imports from Denmark which in 1874, were 26,300 head of cattle, in 1883 had reached up to 119,300 head, while the exports from France are very inconsiderable, amounting yearly only to about 3,000 to 4,000 head. But owing to the outbreak of the cattle plague the imports from this quarter have been completely stopped. From Schleswig-Holstein the exports were gradually on the increase until 1876, when they had obtained the number of 51,000 head, but now that cattle from these places are required to be slaughtered at Deptford, the exports have continued to decline so that in 1883 these exports amounted to only

28,000 head. Holland, also, like the two before-mentioned countries, received a blow in 1877, when the free import of their live-stock was also restricted, the exports from that country, which in 1876, amounted to 86,000 head, being reduced in 1877 to only 14,000 head; but on the other hand the imports from Spain, Portugal, and Sweden have been on the increase, and, as might be expected, it may be accepted as a rule that the exports to England from all those countries enjoying the privilege of free imports have been on the increase, while a considerable falling off is to be noted from those which are placed under the slaughter regulations at the port of import. Of the countries outside of Europe it is seen that the exports from Canada, which first took its commencement in 1875, with about 200 animals, in 1877 had already increased to 7,000, that it has now attained development of 50,000 head. From the United States, while the export to England in 1874 was also only about 200 head, these have likewise increased to a considerable amount as will be seen from the following tabular statement, viz:

Year.	Exports.	Year.	Exports.
	Head.		Head.
1877.....	11,000	1881.....	103,000
1878.....	68,000	1882.....	47,000
1879.....	76,000	1883.....	155,000
1880.....	154,000		

The annual imports of live-stock into Great Britain during the decade of 1874-1883 have been increased from 193,000 head to 367,000, of which the United States of America and Canada have shipped about one-half and Denmark one-third.

In the imports of sheep Germany and Holland occupy predominant positions, these countries exporting annually from 200,000 to 300,000 to the English markets. The exports from Denmark have likewise been steadily on the increase, amounting in the past year to 90,000 head. The sheep trade, in opposition to that of horned cattle, is found to meet with most success at the Deptford market.

Of the fresh-mutton trade the imports for the past five years were as follows, viz:

Countries.	1880.	1881.	1882.	1883.	1884.
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Holland.....	87,500	105,000	123,000	83,100	56,800
North America.....			29,000	41,400	20,300
Australia.....			37,200	103,600	147,800
South America.....				6,100	24,200
Russia.....				400	
Total.....	87,500	105,000	189,200	234,600	249,100

These figures afford a good indication, and account for the reduced prices of this article of food. During the past year especially the sheep trade has been subject to great depression, owing to the largely increased imports of frozen meat, and, unfortunately for the sheep-owners in Europe, there is all prospect of those imports meeting with much greater development in the near future.

The importation of fresh and salt ox meat can date its commencement from the United States of America in 1875, and from Canada in 1876, the exports from the latter country in the year 1883 having reached up to 34,000 cwt. In 1875 the United States only exported 3,000 cwt., in 1877 these had already increased to the large amount of 443,000 cwt., and in the subsequent years these have further increased as follows, viz: In 1874, with 483,000 cwt.; in 1879, with 553,000 cwt.; in 1880, with 721,000 cwt.; in 1881, with 747,000 cwt.; in 1882, with 446,000 cwt., and in 1883, with 730,000 cwt.

As will be observed from these tabulated returns a considerable decline is to be noted in the exports from the United States in 1882, both of live stock as well as slaughtered meat, and it will thus appear that notwithstanding its large supplies, the United States have not yet been able to bring down prices, like as in the grain markets, to such a point as to exclude from the markets their European competitors; but rather that the extent of these exports is more dependent upon the condition of the home prices in our country. Thus, for instance, from 1876 to 1879—when a steady reduction in meat prices was felt in the United States, especially for the first and second class qualities, owing in a measure to the diminished home consumption consequent upon the unfavorable condition of the working classes in the foregoing years and due also to the introduction at that period of the short-horn bull breed for crossing purposes—a large increase of meat products both in regard to quality as well as quantity took place, which led to the rapid development of the export trade in those years; and here it should not be omitted to mention

tries, received a blow in the exports from that in 1883 to only 40,000 and Sweden have been a rule that the exports imports have been on those which are plantations outside of Europe. In 1875 the export to the United States only attained a considerable

Exports
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the decade of 1874-1883 United States of America.

dominant positions, these fish markets. The export amounting in the past to 100,000 cattle, is found

as follows, viz:

1882.	1883.	1884.
Cwt.	Cwt.	Cwt.
3,400	83,100	56,800
9,000	41,400	20,300
7,200	103,600	147,800
	6,100	24,200
	400	
20,200	234,600	249,100

prices of this article subject to great demand, unfortunately for meeting with much

ment from the United States only export amount of 443,000 follows, viz: In 1874, 100 cwt.; in 1881, with 100 cwt.

able decline is to be as well as slaughtered, the United States markets, to such a point that the export prices in our country. meat prices were felt, owing in a measure to the unfavorable condition of the market at that period of meat products to the rapid development omitted to mention

The great development in the fresh-meat trade is essentially due to the great improvement made in the methods employed for the safe carriage of these articles over long voyages. Dry air in cooled compartments of the ship is now used for the full preservation of the meat, and this has now been brought to such points of perfection that slaughtered meat can in these days be brought in sailing ships from the Australian colonies and delivered to the English markets in excellent condition.

A sudden perceptible decline on the other hand becomes apparent in the exports from the United States, when prices at the close of 1881 at Chicago and through the first half of 1882 met with an advance of some 40 to 45 per cent, on the better qualities of meat, due in part to the loss of a large number of animals in several of the Northern States during the previously severe winter, and more especially to the enhanced cost of feed, resulting from the bad cereal crops in the previous year.

The chief effect of this largely diminished supply from the United States in 1882 was a corresponding increase in the supplies from other exporting cattle countries, so that in that year was found to take part in the export of slaughtered meat to England. The imports of live stock into England from Denmark, as will be observed from the following tables, has been steadily and largely on the increase, so that this country may now be considered as taking a prominent position in two of the markets. During the latter years a much larger number of young animals have been sent away than was formerly the case, and at the same time it has to be noted that these increased exports will be found mainly due to the larger exports of cattle in lean or half fattened condition. In fact, it may be stated that the great change which has been made is that in place of sending their cattle as in former years to the marsh lands for fattening purposes, these are now sent to England, whilst the exports of fattened beasts have not increased to any extent worth mentioning. It will undoubtedly seem strange that a country like Denmark, which from olden times has been an agricultural and cattle-raising land, has not made further progress in the fattening branches, whilst the English farmer, who in these times subject to a severe competition and pressure, only disposes of his animals when in fully fattened condition, and which he must find out without doubt is most to his advantage.

The fattened beasts sent from this country are forwarded by a limited number of the most intelligent and enterprising of the farming classes, who have made themselves fully acquainted with all the requirements of the English markets. The causes of this unsatisfactory state of things are perhaps manifold. One of them without doubt will be looked for in the backward state of the root culture in this country, as fattening with grain or other costly feeding stuffs can only become profitable up to a certain point. It may also be partly due to the slow fattening properties of Danish cattle. And again there are always to be met with large numbers of cattle dealers (the middlemen) traveling through the agricultural districts, who exert all their influence to induce the farming classes to part with their live stock, and in this way, without question, a course of fattening is too often interfered with.

In the concluding remarks of the report the Danish agriculturists are at the same time strongly recommended to give greater attention to the improving of their cattle breeds by introducing of good short-horn bulls for crossing purposes, as it would appear to be a general complaint that the Danish breeds do not furnish an equal amount of meat, neither do they fatten in so short a space of time as the short-horn breeds, and it has farther been seen that more favorable prices have been obtained in the English markets on the exports of crossed-bred cattle than for those of the pure Danish breeds; thus it is mentioned that in the spring of last year, 10½ cents per pound was obtained at the New-castle market for some beasts of cross breed, while on the other hand no more than 8 cents were realized for the animals of pure Danish breeds.

HENRY B. RYDER,
Consul.

UNITED STATES CONSULATE,
Copenhagen, January 26, 1885.

THE BELGIAN PROCESS FOR THE PRESERVATION OF FRESH MEAT.

INCLOSURES IN THE CATTLE REPORT OF CONSUL TANNER OF VERVIERS AND LIEGE

REPORT OF FIRST COMMISSION.

We, the undersigned—A. Thiernoep, member and secretary of the Academy of Medicine, veterinary of the State; Professor Ruge Courtroy, chemist; A. Reul, repetitive at the said school; A. Van Schelle, avocat at Brussels, and J. Limbourg, veterinary surgeon, inspector of the meat market at Brussels for the Government—members of a commission constituted for a process for the preservation of fresh meat invented by Dr. Closset, of



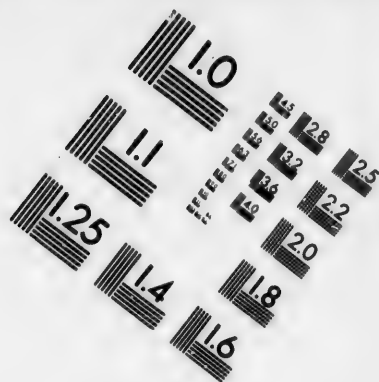
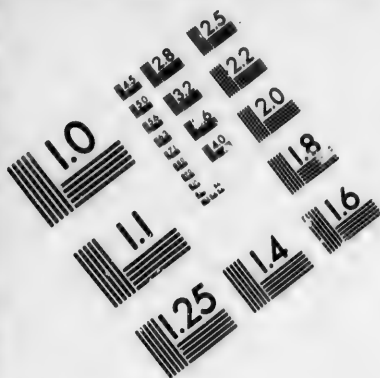
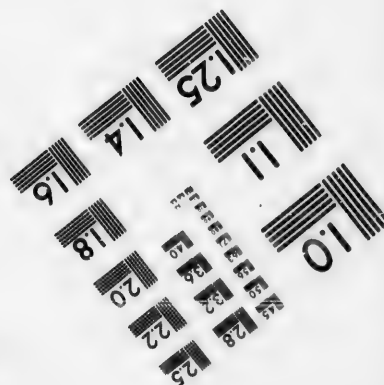
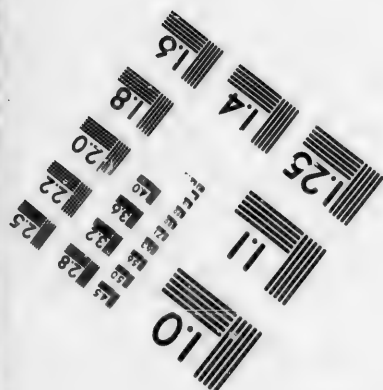
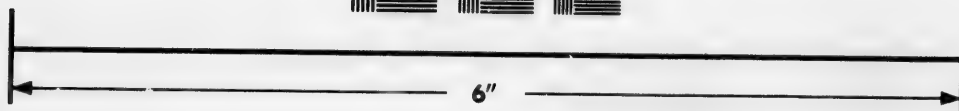
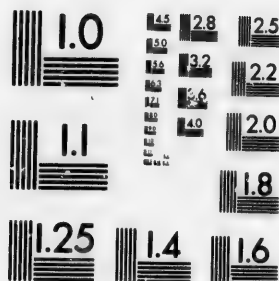


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Liege, assembled in the laboratory at Liege, January 20, 1883, to witness the method of Dr. Closset, declare:

This method consists in preserving fresh meat in an artificial air. Four pieces of fresh meat—a rib of beef, a round of veal, a leg of mutton, and a shoulder of pork—were placed, separately, in air-tight tin boxes, which were deposited in the glazed cellar of the laboratory of Liege. Then we reassembled on the 22d of February, a good month afterwards. The boxes, identically the same, were opened in our presence, and we protest that the meat was preserved perfectly fresh, not even having the look of frozen meat, which, when thawed, looks repulsive and becomes soft and moist and loses its fine qualities in the eating. Having cut the meat, we found the fat, the tissues, the bones, and the marrow of the bones, even the blood, extracted from certain parts of the pieces, perfectly fresh.

After these different experiences we tasted some slices, after having had them cooked naturally, and we were struck with their taste and their tenderness. They had acquired that degree of tenderness, by their being deprived of air and being pressed, which is a condition necessary for an easy digestion.

These pieces of meat have been hung in a triangle in the glazed gallery above mentioned, exposed to the south; we have observed them every day till the 6th of March, and we have found them totally free from corruption and very wholesome, consequently we declare the process of Dr. Closset perfect in the aim proposed.

REPORT OF SECOND COMMISSION.

Experiments made at the slaughter-house at Liege on the 9th of March, 1883

In presence of Mr. L. Browier, medicine vétérinaire, director of the slaughter-house at Liege, also inspector of the butcher-market of Liege; L. Dejuce, doctor; A. Ansiant, avocat, and A. Darvans, industriel, in whose presence was made the following experience.

Two huge pieces of beef and of veal were inclosed separately in two boxes by Dr. Closset, according to the system of which he is the inventor.

The first box containing the veal was opened after three weeks; the meat after being exposed to the air was still intact, and continued so eight days after being taken out of the box, in all, forty-six days after being killed. The meat in the two boxes presented a natural color and spread a fresh odor, and when cooked had exactly the taste and smell of fresh meat. In a word, its physical qualities were those of fresh meat; which is certified by the numerous witnesses present, among whom were Messrs. Nelf-Arban, représentant; Jules Frisart, bornquier; D. Closset, industriel; de Vaux, engineer; Delorme de Nossius, bornquier, &c.

What is above all to be remarked is that after being taken out of the boxes the meat can stay exposed to the air, without losing any of its qualities, ten or fifteen days, and which in all the other operations hitherto tried the meat must be eaten immediately after being exposed to the air.

REPORT OF THIRD COMMISSION.

Report of the commission to which has been referred the account of Mr. Closset, entitled "A study experimental of the possibility of the preservation of meat, fresh, from beyond seas for animal food in Europe."

GENTLEMEN: I have the honor of giving you an account of the examination we have made, M. Dessaire and I, of the report addressed to the company by Mr. Closset, doctor of Liege, having for title "Experimental study for meat from beyond seas, fresh, for animal food in Europe."

In the actual social condition of Europe, animal food for the working class is absolutely necessary. It is also clearly shown that in the middle and southern part of Europe the production of cattle is far from sufficient for the animal food of its inhabitants. After having shown the benefit it would be for the health of the working classes, wholesome animal food to repair their wasted strength daily, and which at the present time is so far above their means of procuring.

witness the method

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March, 1882

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If our population suffer at the present day from the want of that food, there is but one means of remedying the evil, that is to discover a process by which fresh meat can be exported from beyond seas, produced from the numerous flocks and herds there superabounding. After numerous trials, of which he has given a short account, it seems he has realized all the required conditions of preserving the tissues, muscles, fat, and bones in their natural freshness without introducing any strange substance. This process in fresh meat being inclosed in air-tight tin boxes, after the manner of Mr. C., the meat loses none of its freshness either in color or taste; at least this is the result as shown to us of the veterinary laboratory belonging to the State, composed of Messrs. Thiernepe, Van Schelle; Limbourg, inspector of the markets at Brussels; Coartoy, professor; Burt & Musselman, reporters at the University.

After having assisted at the preparation of five tin boxes, containing large pieces of beef, mutton, veal, and pork, the commission above named has seen, after thirty-two days, the meat come out as fresh as when it was put in, losing nothing either in color or taste.

We believe it useless to insist further on the consequences of Mr. Closset's discovery or the effect it will produce on our working population, a plentiful supply of wholesome animal food. Considering the importance of this communication, we have the honor—

I. To address thanks to the author.

II. The insertion of his work in the Bulletin.

These conclusions are adopted.

FEEDING CATTLE ON THE SOILING SYSEM.

REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

The soiling system, or the feeding of green crops where they are carried to the yards or houses for the animals from spring to autumn, has been too much neglected in England, perhaps owing to the excellence of our permanent pastures. Professor Brown, of the Agricultural College, Ontario, has paid much attention to this system, and he estimates the proportionate feeding values of various green foods as follows: Green fodder from good pasture having a feeding value of 40, that of lucern is 38; of sanfoin, 28; red clover, 31; prickley comfrey, 27.

The best green food for soiling, therefore, says Mr. Evershed, a well-known English authority, is the produce of rich pastures, and Professor Brown recommends for Canada the cultivation of other soiling crops only because the pastures of that country are unreliable for continuous progress in the production of beef or milk. The rich old grass lands of England cannot be secured there. The droughts and frosts of an extreme climate prevent the growth of that excellent variety of pasture plants which secures a close bottom. There may be rain enough, but it is not properly distributed so as to supply what the professor calls the "regular top-dressing which is essential to continuous greenness." Hence the farmer himself must "make good the balancing of things that have been displaced in nature" by the growth of crops suited for soiling. Mr. Brown does this at the college farm successfully; "and with such a sun as ours," he says, "enormous agricultural wealth may be attained by the production of repeated crops of fodder by means of the plants just named. I have no doubt the old turf of England has discouraged the practice of soiling, and I think we shall find that the same advantages attend the system here as in Canada."

But first let me borrow a leaf from Mr. Brown. He sows down 20 acres with soiling crops in a 100-acre farm, and grows 234 tons per annum of green forage, the lucern yielding 16 tons per acre; the sanfoin 6 tons; the red clover, 7 tons; mixed tares and oats, 6 tons; prickley comfrey, 10 tons; cabbage, only 12 tons. The average is less than 12 tons per acre, and I think that in England the general average would be a great deal more. Each animal consumes 100 pounds of green fodder daily, with other food, according to circumstances, so that 26 head would be maintained on the 20 acres during the six months when this forage is available, or about one-and-a-sixth animal per acre as against one animal on 3 acres of permanent pasture. In Canada, it seems, animals fed in a 20-acre pasture walk several miles a day searching for a bellyful. Half the animals on Mr. Brown's 100-acre farm are kept for feeding, the rest for the dairy. He gives some of the fodder to his horses and pigs, and maintains with the rest twenty cattle instead of twenty-six, as he might do. In fact, by setting aside 20 acres in 100 acres, he claims to

keep twenty cattle instead of seven, the usual number found on a farm of that size. The financial results of soiling 20 acres of forage during six months are:

Ten fattening cattle (108 tons fodder at \$2.15, \$232; attendance, \$50)	\$282
Two milch cows (86 tons fodder, \$184; attendance, \$40; milking, \$20)	244
Outlay	526
Increase on 10 cattle, \$5 per head per month	300
Manure	50
Milk from 10 cows, 180 days, 10 quarts at 1½ cents	225
Manure	40
Forty tons fodder to other animals	88
	701
Balance profit	175

These figures are offered merely for the sake of comparison. They show that Professor Brown obtains for rent and profit about 35 shillings per acre, the value of the land being less than 15 shillings an acre. He charges against the land about 9 shillings per ton as the cost of the forage or about £5 5s. per acre, the yield of the crop being less than 12 tons per acre. He sells the milk at a halfpenny and an eighth per quart, and his cattle increase in value about 5 shillings per week. In England all the figures must be altered to adapt them to the very different circumstances, and each person who adopts the soiling system must alter the figures according to his own particular circumstances.

One of the most successful examples of soiling that I have ever seen was on rich land on the south coast, near a large town and in mild climate. The value of the produce on milk and butter is at least four times as great as in the example I have just offered, and the yield of forage per acre is quite 50 per cent. higher. Every kind of forage which is usually found on fertile land, or which Mr. Brown has mentioned, grows well except sanfoin and prickly comfrey, which have not been attempted. Lucern, which is the best soiling crop of Canada, flourishing under a hot sun, yields more than the 16 tons an acre which Mr. Brown no doubt correctly attributes to it. Cabbages, for which he only claims 12 tons an acre, yield 40 tons, and though they are hardly a "forage crop," they are one of the most useful and quite the most productive of the soiling crops. Another advantage on the same farm, with its warm, deep soil and sheltered aspect, is the extension of the season. Trifolium, a prominent crop in the district, is nowhere forwarder, and the permanent pastures, which are mown for soiling at any time when required, are nowhere later in their growth.

To carry out the soiling system advantageously we require green crops, and several sorts of some of them, early and late, so as to extend the period of feeding, and to prevent the occurrence of gaps in the regular provision of food. On the farm in question there are four sorts of trifolium—early, late, later, latest—the last named being a recent acquisition, and a timely one. There are two sorts of red clover blossoming this year (1883) about June 20 and July 5, and the earlier of these is now (July) entirely saved for hay, the introduction of the "later" and "latest" trifolium having extended the trifolium season into the middle of July, when pastures follow, and other succulent food, such as cabbages, becomes abundant. A debtor and creditor account for this farm, if I could offer one, would no doubt be interesting, but it would not be so edifying as a similar account for his own farm by any agriculturist who may try the soiling system. It is certainly profitable on this farm, and will prove so elsewhere, in a degree varying according to soil, climate, management, and the value of the produce. The cows on this farm are nearly all of the Alderney breed, and they are fed with corn, bran, and cotton cake, in addition to their green food; and as the sale of butter removes from a farm less of the soil constituents than any other kind of farm produce, and as hay and roots, which remove in their sale more than wheat or barley, acre for acre, are rarely sold, the land grows richer year by year. It is admitted that the site is favorable for soiling; but the system succeeds on very different sites—where the rent of the land is twenty or twenty-five shillings per acre instead of three pounds, as in the case of the farm just noticed.

On a cold, poor hill, where Alderney cows would perish, I have known a very successful example of the system here recommended. The forage crops were different. Lucerne was replaced for sanfoin, and tares sown for succession, and "seeds," mixed clovers, and rye grass were prominent. The kind of produce in this case is young beef, highly fed from calfhood, and the calves reared at home at the homestead under the hill.

There are certain great advantages attaching to this system, especially in the case of all mature animals, fattening cattle, and milking cows. Young animals will be better in

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the field as a rule, unless they are to be fattened and killed young; and in that case the soiling system is most successfully applied, as it is in the case of growing pigs, which are not a very desirable kind of stock to ramble in the fields, and are very properly fed in yards. In the case of small farming, the soiling system is specially adapted to the circumstances that usually obtain on small farms, and therefore in many parts of France and other continental countries it prevails. In the wine districts you will find it universal, and very properly so. The manure goes chiefly into the vineyards, and it is produced under the soiling system by cattle bedded with the straw of the grain crops. A poor, unmanured pasture would only maintain about one cow per acre, but the green forage produced on a single acre of the several grain crops will suffice for three cows.

Both on small and large farms animals are fed on this system through the summer with obvious advantage in several respects. They are kept in the cool, and are spared the annoyance of flies, which in some districts are particularly harassing. Their food is used with economy; and instead of having to wander for miles to and fro, as they do sometimes on poor pastures, to obtain half a bellyful, the nourishing and bulky succulents which they love are brought to them and they take their fill in comfort. Then, the crops they are fed on are of the most productive kind. They are grown with the greatest economy of land, and there is no tramping under foot of the herbage in its consumption nor fouling it with excrements. In most situations from two to five times more cattle can be kept by soiling than by depasturing; and it is a point worth notice that much second-rate pasturage can only be grazed in summer by lean stock, owing to the annoyance of flies in some districts, and that corn would be thrown away if it were given to the animals under such circumstances. This refers especially to the drier and hotter parts of the country which are least adapted to natural pasturage; and these are the districts where soiling offers most advantage.

The soiling system is practiced more generally than in any other country, and there cut grass is brought to the cows all the summer—mowing often extending over four and even five times—but it is regularly followed with liquid manure. In England, as a rule, the holdings do not permit of such heavy manuring of grass land, but where it is conducted there is saving of time and better crops, especially on heavy soils which drain better without the weight of cattle continually upon them. Hedges and ditches and drains are also much less troublesome, but against this there is the labor of extra mowing.

MIXED FOOD FOR CATTLE.

REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

The following specimens of mixed foods for fattening bullocks were last year collected from the Highland and Agricultural Society's members. A number of my correspondents have kindly supplied me with a statement of the diet on which they are accustomed to feed their cattle—both feeding animals and stores—and we proceed to give specimens of these. It will be seen that in every instance very much less weight of turnips is allowed than the beasts would consume if an unlimited supply of bulbs were placed before them.

Mr. Buttler, Coupar-Angus, gives his feeding cattle the following mixture, costing 10 pence, or thereby, daily:

	Pence.
15 pounds cut straw	—
56 pounds ($\frac{1}{2}$ cwt.) turnips (pulpd) at 6d. per cwt.	3
2 pounds linseed meal at 1 $\frac{1}{2}$ d. per pound	3
4 pounds cotton-cake (decorticated) at $\frac{1}{2}$ d. per pound	3
1 pound treacle (diluted) at 1d. per pound	1
	10

The above is given in three feeds, and after a time the richness of the mixture is increased by adding cut grain, such as oats, beans, and maize, to the extent of about 3 pounds, costing about 2 pence a day extra, bringing up the cost of feeding to a shilling per day exclusive of straw but inclusive of roots. Mr. Buttler thinks that 2 cwt. of turnips would be consumed by a fair-sized bullock, if getting nothing else except strew, which at 6 pence per cwt. costs the same as the richer of the above diets. He adds that even with all this quantity of turnips it is difficult to turn out a well-finished

beast without a little cake and corn in addition. Mr. Buttar's diet for young store-cattle is as follows:

	Pence.
15 pounds cut straw	1
28 pounds ($\frac{1}{2}$ cwt.) turnips (pulped) at 6d. per cwt.	1 $\frac{1}{2}$
1 pound linseed meal, at 1 $\frac{1}{2}$ d. per pound	1 $\frac{1}{2}$
3 pounds cotton-cake, undecorticated	2
1 pound treacle, at 1d. per pound	1
	8

Mr. Buttar's testimony is to the effect that in the above mixture, costing 6d. daily, his stores are kept in much better condition than 1 $\frac{1}{2}$ cwt. turnips, which at 6d. per cwt. would cost 9d.

Mr. Dalziel, Dumfries, at the commencement of the season, places his feeding cattle on the following allowances: 56 pounds turnips, pulped and mixed with chaff, 2 pounds linseed cake, 2 pounds Waterloo cake, and 4 pounds Indian meal, well mixed with hot water. After two months, a pound of cake and a pound of meal additional are given. The average expense of the supplemental food is 1d. per pound—that is, 10d. daily, or 5s. 10d. per week for each beast when the animals are on full feed. Longstraw *ad libitum* is also at the command of the cattle. Mr. Dalziel is of opinion that if $\frac{1}{2}$ cwt. of turnips were given instead of $\frac{1}{2}$ cwt., the cattle would not make so much progress. We have already referred to the experience of Mr. Bryce with cut hay, oat straw, or wheat chaff. Many years ago, that gentleman informs us, he used to make bullocks very fat on Swedish turnips and wheat straw, an unlimited supply of each; but on this diet it took about eight months to make his cattle ripe for the butcher. Now he succeeds in making them equally fat in one-half the time by feeding them according to the following system: He pulps the turnips and mixes them, and adds 2 or 3 pounds per head of corn meal, the whole being allowed to stand for 24 hours to allow the meal and chopped fodder to become thoroughly saturated with the moisture from the turnips. The beasts are fed three times a day with this mixture, two and three year old bullocks getting about 80 pounds and younger cattle 60 pounds each. In addition, from 4 to 6 pounds of linseed cake (home made) are allowed per head, according to age, with an ordinary allowance of fodder.

Mr. Wilson, Ballencrieff, arranges his cattle in different sets of courts, according to their forwardness of condition, and his scale of allowances in food is a graduated one, a different quantity being given to each set. When the courts containing the first quality of beasts are cleared they are refilled from the second courts, and so on. The following is the usual scale of daily allowance for each lot:

First, or more advanced lot.

	Pence.
10 pounds chaffed clover hay, at £4 per ton	4 $\frac{1}{2}$
56 pounds ($\frac{1}{2}$ cwt.) turnips at 6d. per cwt.	3
4 pounds linseed-cake, at 1 $\frac{1}{2}$ d. per pound	6
5 pounds mixed meal, at $\frac{1}{2}$ d. per pound	2 $\frac{1}{2}$
	15 $\frac{1}{2}$

This it will be seen is exceptionally liberal feeding, but Mr. Wilson from his business in Edinburgh has special reasons for desiring to have command of the highest quality of beef.

The second courts are getting the following diets each day:

	Pence.
5 pounds chaffed hay, at £4 per ton	2
5 pounds straw chaff, say	1
84 pounds ($\frac{3}{4}$ cwt.) turnip, at 6d. per cwt.	4 $\frac{1}{2}$
2 pounds cotton-cake (undecorticated)	1 $\frac{1}{2}$
3 pounds mixed meal, at $\frac{1}{2}$ d. per pound	1 $\frac{1}{2}$
	10 $\frac{1}{2}$

The cost is here about 10 $\frac{1}{2}$ d. per day. No straw is given as fodder, but the cattle are roughly littered. In comparing the outlay on Mr. Wilson's cattle with others, it should be noted that an estimate is put on fodder in the former case which has not been calculated in the latter.

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FARMING IN BELGIUM.

(M. FRANÇOIS FLECTRET TO CONSUL TANNER.)

The system of managing cattle which is practiced by our farmers has been in use among them from a very early period, and the neighboring cantons of Limburg, Verviers, Bissen, Fléron, and Dalhem have likewise adopted it; it is the only one of this kind adopted in Europe; it is so arranged that all the cows calve from February 1 to May 1.

Any cow not with calf by August 15 is fattened and sold to the butcher in autumn. Sometimes, if she is a first-rate milker, the farmer winters her, gets her milk, feeds her with meal and good hay, and in the month of March she is in fit condition to be sold to the butcher.

Intelligent farmers take care that cows that have calved in March and April shall be well fed with meal, oil-cake, and the best of hay, so that they may be in good condition when they are turned out to pasture early in May, according as the spring is more or less advanced. All who are able to appreciate the value of permanent grass will readily understand how abundant must be the yield of good milch cows when allowed to graze in our rich old green meadows. After they have been in pasture for some days, they are no longer housed; they remain all night in the meadows until the month of December, or rather until the grass is entirely covered with snow.

The cows are milked three times a day for six months; the first milking takes place at 4 o'clock in the morning, the second at 11 o'clock, and the third at 7 p. m. During the months of April and November, and a part of March and December, they are milked but twice a day; the intelligent farmer always manages it so that each animal has a rest of at least two months from the day when she is last milked until calving time. This is done so that she may not be exhausted.

Not only do the farmers' wives, daughters, and maid servants milk the cows; the farmers themselves, their sons, and menservants are not ashamed to perform this task.

The proper milking of a cow is a scientific piece of work; it requires considerable strength in the wrist, for not a drop of milk should ever be left in the udder, for the very good reason that the milk is in the udder as it is in a milk-pan; in the cream-pan the cream is on top; it is, therefore, readily seen that the last tenth of the milk extracted is the richest fraction that the udder contains.

It is not long since many land-owners bought cows that were not with calf, in the spring, and fattened them in their rich pastures.

A farm of ten hectares (25 acres) afforded pasturage, early in May, for twenty-five animals, some of which were fat by the 1st of July, especially those crossed with the Durham breed; these cattle have always been found superior to the Dutch and native breeds, as regards fattening qualities. It was considered that the land-owner made a profit of 150 francs (\$30) on each cow, which made a total profit of 3,750 francs (\$750). This practice has been given up since the price of butter has exceeded 3 francs per kilogram. Two or three cows in process of fattening are still found here and there among a herd of milch cows, but no farm is now entirely devoted to the fattening of meat-cattle. The flesh of a cow from four to five years old, fattened in the rich pasture of Herve-Aubel, is far more tender and succulent than that of a fat ox six or seven years old.

The breed of our province, which was originally very good, has been improved by an admixture of Durham and Dutch blood. A number of Durham bulls have been kept at Battice, Tenven, Sippenaeken, and Wegimont, near Herve; thousands of calves of both sexes, sired by these bulls, have been reared and disseminated throughout the district.

The farmers always select their cows with great care; they place a very high value upon good milk-producing qualities, and it is not uncommon to meet with cows that give milk enough in one day to make a kilogram (2½ lbs.) of butter, and even more. The success of the farmer depends, beyond a doubt, upon a judicious selection of his cattle.

The cows most sought after in the spring are those which have calved for the first time, and whose age is about thirty months. These animals, if they have been raised in third or fourth rate meadows, develop admirably in first-class meadows, and become splendid milkers. Four thousand francs are not unfrequently paid for a cow thirty months old that has had her first calf.

There are in the district magnificent animals of the pure breed of the country; their form is highly symmetrical and their frame is in no way inferior to that of Durham or Dutch cattle.

These cattle of our district are usually excellent milkers. It is consequently much to be wondered at that our farmers, who are so intelligent, economical, and mindful of their

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interests, do not form an association for the purpose of improving the breed by means of selection. To attain this end it would be sufficient to select the most highly improved cows, to procure a bull irreproachable in all respects, and to raise twenty or more calves every year. These calves at the age of one year would be sold to the highest bidder, and repurchased by the parties who had raised them, or by their neighbors, an estimate having previously been made with a view to indemnifying the raiser for the expense incurred by him in keeping the animals from the time of their birth to that of the sale.

About thirty years ago farmers raised no calves, for the reason that they were able to purchase in the breeding districts excellent milch cows for from three to four hundred francs (sixty to eighty dollars); but since the average price of first-rate cows has risen to 500 francs (\$100), and is sometimes even upward of \$600 francs (\$120), they have taken up cattle-raising, and they have acted wisely in so doing, for, as they raise none but calves whose dams are first-class milkers, they thereby perpetuate the good milking qualities of their herd.

Although bulls begin to leap at the age of eighteen months, the calves produced by them at that age are generally excellent. The number of these breeding animals has doubled in the last few years. There is now scarcely a farmer owning ten cows that does not keep a bull. He thereby secures the following advantages: There is no necessity of removing the cows to a distance for the purpose of mating, and the probability of a cow's conceiving is much greater than when she is taken to a bull exhausted by too many leaps. This system is not costly, for a bull born in February is able to leap in June or July of the year following; he is sold to the butcher in September or October for as much as a fat heifer would bring. His leaps have consequently cost nothing, and the desired result is assured.

One thing that has greatly contributed to the advancement of agriculture in the district of Herve-Aubel is the good understanding that has always existed between the landowner and his tenant; and yet leases are only made every three years. They are for three, six, and nine years, and always begin on the 1st of May. A tenant leaving a farm leaves all the manure that has accumulated during the winter for the use of his successor; he is strictly forbidden to remove any hay, even if he brought some when he came, but he has a right to arrange matters so as to have all the hay consumed by his own cattle, the number of which increases or diminishes in winter, according as feed is more or less abundant.

So far as I am aware not a single landlord has been obliged of late years to levy on a tenant's cattle for non-payment of rent. Rents are paid twice a year with the utmost punctuality.

When a tenant gives up a farm he proceeds, through the agency of a notary, to have his live-stock and farming implements sold at public auction, and such sales are made for cash, 5 per cent. being added to pay the notary's fees and the expenses of the sale. If the seller has the reputation of keeping fine cattle the bidding is enthusiastic in the extreme. There is no need of giving credit to purchasers. So far from this being the case, if the seller should make it known that the sale would be made on credit purchasers from the district would not attend the sale. The reason why they would not is readily seen. These farmers, as a general thing, have sufficient capital to work their farms, and they do not intend that parties who have no money shall compete with them.

This practice differs not a little from that which is in use in the other agricultural cantons of the province, where 15 per cent. is added to the price of horses, cattle, and implements purchased at public sale. However this may be regarded, the increase is at the expense of the seller.

The rent of a farm is sometimes fixed according to the number of cows that may be kept on it, and sometimes at so much per hectare. While some farms are still let for less than 200 francs per hectare, the land which they contain is fourth and fifth rate land.

First and second rate meadow lands are rented at from 250 to 300 francs (from \$50 to \$60), while the very choicest lands bring 400 francs (\$80) per hectare. These are situated near the town of Herve, the burg of Aubel, and the beautiful villages of Lattice, Chaineux, Charneux, Clermont, and Thimister. Ten hectares (25 acres) of these very choice meadow lands afford pasture for from twenty to twenty-four animals in summer and sufficient hay to winter at least twenty.

The farmer who undertakes to work a farm, whether large or small, always has the capital required for the purchase of the necessary stock and agricultural implements. Six thousand francs (\$1,200) are required for a farm of 10 hectares (25 acres). As to implements, their cost is insignificant. He will need a dozen pitch-forks and as many rakes, two shovels, two dung-forks, a straw-cutter, one or two wheel-barrow, dairy utensils, and furniture. Farmers who work 12 or 15 hectares (30 or 37 acres) and upward keep a horse, which they use for hauling hay, manure, fuel, and lumber. They hitch him to a wagon so that he may take their produce to market, and sometimes let him work for the neighbors.

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* In France the average price of arable land per hectare was, in 1862, 2, 198 francs (\$440); of meadow land, 3,377 francs (\$676); of vine land, 2,737 francs (\$546). The rent paid for a hectare of land was, on an average, 70 francs (\$14); for meadow land, 109 francs (\$22); and for vine land, 102 francs (\$20.50).

An architect in Verviers recently prepared an excellent plan of a stable for 24 head of cattle; it is 22 meters long by 6 wide (60 by 10 feet). Iron rafters support the vault; four rows of cows are accommodated in it with ease, and there are two passages, one for two rows. The animals that form the two middle rows are placed back to back. A stable of this kind costs but little, and unites in itself every hygienic advantage.

Care is taken to build the bake-house of each farm at a sufficient distance from the other buildings to avoid fires. The hog-sty is generally built close to the bake-house.

No litter is made; the cows lie on the hard floor, which is kept in a state of constant cleanliness. The droppings of the animals are taken and piled up in a manure ditch, which adjoins the buildings. The ordinary causes of waste of fertilizing matter are not to be feared here, as the manure is firmly piled.

The part of the farm where the cattle are kept usually consists of land somewhat higher than the orchard; the rain water that falls from the roof on the manure heap, some elements of which it absorbs, is led through small trenches to the orchard, which is irrigated by it, so that nothing is lost.

At a short distance from the buildings there is a pond of water which is collected from the roofs or from the little springs, with which the district is abundantly supplied. There is not a meadow without its pond, this being one of the first requirements on a farm consisting entirely of permanent meadows.

There are, we think, 1,000 farms in the district of Herve-Aubel. The orchards which surround the buildings are planted with walnut, apple, and pear trees, but very seldom with stone-fruit trees; according to statistics, there are 1,600 hectares (4,000 acres) of orchard or of wooded meadowland. These figures must be accepted as correct, for there is, at most, for each farm one hectare and a half planted with fruit trees at the rate of 80 trees to the hectare. The district of Herve-Aubel, therefore, has 128,000 fruit trees in full bearing; yet, although they are cared for and trimmed with the utmost diligence, and although the cattle deposit an abundant supply of manure about them, there is an abundance of fruit not oftener than once in three years. The value of the average yield of each tree, in years when the crop is abundant, is estimated at 10 francs, which makes an income for the district of 640,000 francs (\$108,000) every three years.

Although these figures appear high, the number of orchards is not increased, because the experience of more than a hundred years shows that the milk of cows pastured in meadows without trees is richer than that of those which graze in orchards. The latter, being shaded, do not receive the sun's rays. Another reason is that, if meadows intended to be mown were planted with trees, the grass, being deprived of the heat of the sun, would need several days more than it does now for drying.

Many farmers sell their fruit to dealers, who resell the good qualities in the towns. Others convert them into sirup and vinegar, of which they lay in a stock in years when the yield is abundant.

Drunkenness is unknown among the great majority of the farmers in this district; consequently a state of comparative affluence prevails, which is the result of industry, order, and economy; morality and uprightness are the main characteristics of the inhabitants.

Refinement, moreover, is not lacking; one needs only to be present at the conclusion of high mass on Sundays and feast days in order to see and admire the elegance of the young people of both sexes.

This district is abundantly supplied with means of communication; in addition to the main roads which intersect it, first class minor roads have been built between the various villages and hamlets.

The subject has been somewhat agitated of late years of a railway from Battise to Bleyberg, via Aubel; there is no doubt that this plan will be carried out, either by the state itself or by a company to which a very low rate of interest on the amount is guaranteed by the state. What is called the network of railways of the plateaus of Herve would not be completed if Aubel were allowed to remain isolated; it is, therefore, a matter of strict necessity that the burgh of Aubel and the neighboring localities should be connected with Verviers, their shiretown; this district, moreover, offers great advantages to a railway, since it does not produce any grain, and all its cereals are brought from other places. No potatoes even are raised here; all that are used are brought from Ardennes and from Holland.

ST. JEAN SART-AUBEL, *October 17, 1883.*

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LIVE STOCK IN BAVARIA.

REPORT BY CONSUL HARPER, OF MUNICH.

The counting of live-stock in Bavaria was taken in January, 1883, and in connection therewith the average market value and average weight of the various animals. From this accounting we gather the following:

The total capital so invested was \$189,706,761.69, divided as follows:

Description.	No. of head.	Total value.	Value per head.
Horses:			
Foals under 1 year of age	19,973	\$744,611 08	\$37 27
Horses 1 year and under 2 years of age.....	21,442	1,338,609 34	62 43
Horses 2 years and under 3 years of age.....	17,748	1,653,127 79	93 61
Stallions 3 years old and over.....	4,007	1,026,506 04	256 18
Other horses 3 years old and over.....	293,141	33,586,634 49	114 02
Total.....	356,316	38,249,490 75	107 34
Mules.....	83	5,236 00	63 07
Asses.....	152	3,643 78	23 97
Neat-cattle:			
Calves under 6 weeks old.....	90,482	778,710 63	8 59
Calves from 6 weeks to 6 months old.....	218,686	3,466,256 56	15 85
Cattle 6 months to 2 years old.....	688,318	22,017,083 45	31 99
Bulls 2 years old.....	32,305	1,845,087 15	56 95
Bulls and oxen 2 years old and over.....	422,761	27,671,335 37	65 45
Cows 2 years old and over.....	1,584,456	77,917,916 79	49 17
Total.....	3,037,098	133,686,388 85	44 03
Sheep:			
Wool sheep under 1 year old.....	38,274	145,444 89	3 80
Wool sheep over 1 year old.....	69,749	364,375 38	5 20
Meat sheep under 1 year old.....	41,977	162,485 22	3 80
Meat sheep over 1 year old.....	108,006	611,175 91	5 60
Other sheep under 1 year old.....	221,106	606 910 62	3 00
Other sheep over 1 year old.....	698,978	3,051,404 66	4 40
Total.....	1,178,270	5,025,802 68	4 40
Swine:			
Under 1 year old.....	759,923	6,834,990 15	9 00
Swine kept for breeding over 1 year old.....	131,842	2,445,410 02	18 00
Other swine over 1 year old.....	146,579	2,097,034 80	18 00
Total.....	1,038,344	11,977,434 97	11 60
Goats.....	220,818	748,764 66	3 00

The living weight of cattle and swine was as follows:

Description.	No. of head.	Total weight.	Weight per head.
Cattle:		<i>Pounds.</i>	<i>Pounds.</i>
Calves under 6 weeks old.....	90,482	8,986,019	93
Calves 6 weeks to 6 months old.....	218,686	38,749,955	117
Young cattle 6 months to 2 years old.....	688,318	264,521,569	384
Bulls and oxen 2 years and over.....	465,156	888,676,576	853
Cows 2 years old and over.....	1,584,456	1,097,692,807	692
Total.....	3,037,098	1,798,026,926	

JOSEPH W. HARPER, Consul

UNITED STATES CONSULATE,
Munich, November 6, 1883.

BRITISH CATTLE STATISTICS.

INCLOSURES IN CONSUL-GENERAL MERRITT'S REPORT.

The following is a copy of a printed circular sent from the consulate-general at London to leading cattle breeders and raisers in England. The answers to this circular constitute the "inclosures" referred to in the consul-general's report; and such portions of these inclosures as are not incorporated in said report, and are otherwise considered of practical value to American agriculturists, are herewith published:

DECEMBER 24, 1883.

SIR: The favor of information on the following subject would much oblige, to enable the Department of State, Washington, to locate such foreign domesticated animals as have been for a long time profitably bred and reared in their native homes, under similar conditions in the United States. Please forward the same in the inclosed addressed envelope to

H. KAINS JACKSON.

DISTRICT:—

ALTITUDE.		MEAN TEMP.	TEMP. IN SUMMER.	WINTER.
Soil	—Alluvial Loam Clay Sandy, &c., &c.			
Subsoil	Geological strata			

PASTURAGE, NATURAL OR ARTIFICIAL GRASSES:—

How stock is housed?
Methods of feeding?
Do. breeding?
Do. marketing?

NAME OF BREED:—

Size at maturity.	Cow.	Bull.	Or.
Live weight.			
Annual average yield of milk in pounds or quarts.		{ Pounds of butter. Pounds of cheese.	

ORIGIN OF BREED:—

Description, and how long pure bred?			
Color.			
Maturity.	Weight.	Age.	
Product in 1 hour.			
Meat.	Milk.		Cheese.

GENERAL REMARKS.—The above questions are furnished rather as hints than for categorical answers; and you are asked here to offer any information and suggestions, and in any form you may wish to write them, in respect to horses, sheep, or pigs, as well as cattle. The object of this circular is that the American agriculturists and stock-breeders may learn the best varieties of stock to purchase from abroad as adapted to their own special localities.

THE SANDRINGHAM HERD.

[Inclosure No. 1 in Consul-General Merritt's report.]

Stock is housed at night; cows and heifers always run out. The feeding is chiefly hay, mixture of best linseed, and cotton—from 3 to 7 pounds. Heifers come in with first calves about thirty-two months old.

As a breeding herd the milk is entirely devoted to calf-raising.

The present herd were started by the Prince of Wales in 1877.

The Prince of Wales has a herd of Bates & Knightley Short-horns and one of Booth, and in both cases the cattle are treated as a tenant farmer would do, the object being

to make the animals as hardy as possibly can be managed. The land, as stated above, is various and the district cold.

The Prince keeps also a small herd of Alderneys and a stock of Southdown ewes, also a few black Polled Scotch cows for breeding cross breeds.

Short-horns and sheep are exhibited at the various agricultural societies, and His Royal Highness took the prize last year at the Royal Agricultural Society, held in York, for the best Short-horn family of five. The Prince took first for aged rams at York and champion at the Royal Counties.

All stock can be inspected by making an appointment in writing and giving two clear days' notice.

EDMUND BECK,
Agent, Sandringham, Norfolk.

The nearest station is Wolferton, and the Booth herd is within one minute of the station.

CATTLE IN THE WEALD OF KENT.

[Inclosure No. 8 in Consul-General Merritt's report.]

The Sussex breed of cattle has the appearance of being nearly identical with the Devon, and has been the prevailing stock throughout Sussex and a large portion of the Weald of Kent for a very long period. It is a hardy, kindly animal, yielding a high quality of beef and fats readily. Until lately they were much valued for working purposes, but as milkers they are of but little use, the calf taking nearly the whole of the cow's milk to rear it. They are yarded in winter on account of the wetness of the soil and not on account of any delicacy of constitution.

W. MORLAND,
Lamberhurst Court Lodge, Kent.

CATTLE AND SHEEP IN BUCKS.

[Inclosure No. 9 in Consul-General Merritt's report.]

My farm is on a hill, sloping into the valleys all around it. The soil varies from strong clay at the bottom to deep loam on the sides, and stone brush on the top of the hill. It is a mixed farm of about 270 acres arable, and 330 pasture. I keep a breeding herd of about 70 milch cows—Short-horn grades; sell milk, and wean my heifer calves; cows average when in milk about 16 pints of milk each per day. I keep a flock of Oxfordshire down sheep. I lamb twelve score ewes, breed rams, and sell about 100 shearing rams annually; have an auction sale the first Wednesday in August or last Wednesday in July, when I sell about 60 of the best. Last year they averaged £23 9s. 6d. each in 1882, £26 13s. 8d. each. Many are sold to go to Germany to cross the Merinos, some go to America, the rest to the leading stock-masters in England. I have bred this breed for nearly thirty years, keep up the pedigrees, and show at the "Royal" and some few other leading shows, with what success the "journals" of the Royal Agricultural Society of England will tell.

P. S.—I might say the Oxfordshire down sheep seem adapted for all climates, all soils, and all systems of management, and improve any breed of sheep they are crossed upon, especially Merinos.

JOHN TREADWELL,
Upper Winchenden, Eylesbury, Bucks.

PRIZE BREEDERS OF BRITISH CATTLE.

[Inclosure No. 11 in Consular-General Merritt's report.]

A statement of the breeds and ages of the animals which have won the gold medals, silver cups, and champion plate, offered by the club for cattle, to the year 1881 inclusive, together with the names of the exhibitors and breeders.

NOTE.—The portion of the following up to the year 1857 inclusive is extracted from the "History of the Smithfield Club," by Sir B. T. Brandreth Gibbs, honorable secretary.

EXTRA PRIZE £10 FOR BEST STEER OR OX IN THE FIRST SIX CLASSES.

Year.	To exhibitor.	Breeder.	Breed.	Age.
1807	William Flowers.....	James Walwyn.....	Hereford ox, no age named.....	y. m. d.
1808	Samuel Chandler.....	William Walker.....	Hereford ox.....	0 0 0
1809				6 0 0
1820	Discontinued.			

GOLD MEDALS FOR BEST IN ANY OF THE CLASSES.

1830*	Self.....	Marquis of Exeter.....	Durham steer.....	3 10 0
1831	Self.....	Earl of Brownlow.....	Durham ox.....	4 7 0
1832	Self.....	J. B. Topham.....	do.....	5 7 0
1833	Henry Townshend.....	William Townshend.....	Durham heifer.....	4 9 0
1834	Self.....	Earl Spencer.....	Durham ox.....	4 6 0
1835	George Peach.....	John Dent.....	Durham heifer.....	4 11 0
1836	John Verney.....	Marquis of Tavistock.....	Hereford steer.....	3 10 0
1837	Self.....	R. W. Baker.....	Short-horn heifer.....	3 5 0
1838	C. Hillyard.....	Ex. of la's Mr. Talbot.....	North Devon ox.....	4 8 0
1839	Earl of Warwick.....	R. Hill.....	Hereford ox.....	4 11 11
1840	Self.....	Earl Spencer.....	Durham ox.....	5 0 7
1841	Self.....	R. Wright.....	Durham cow.....	5 2 0
1842†	Mr. Maxwell.....	Sir Charles Tempest, Bt.....	Short-horn cow.....	6 8 0
1843	Sir Charles Tempest, Bt.....	Self.....	Short-horn heifer.....	4 9 0
1844‡	Henry Brown.....	Self.....	Durham heifer.....	4 0 0

GOLD MEDALS FOR STEER OR OX (BEST IN THE CLASSES).

1845	R. M. Layton.....	P. Prosser.....	Hereford ox.....	4 8 0
1846	Earl of Warwick.....	John Thomas.....	do.....	5 0 17
1847	W. D. Manning.....	Self.....	Short-horn ox.....	4 4 0
1848	Earl of Leicester.....	Self.....	North Devon steer.....	3 8 0
1849	Richard Jones.....	James Cartwright.....	Hereford ox.....	4 10 0
1850	William Heath.....	James Bill.....	Hereford steer.....	2 10 0
1851	Edward Longmore.....	Self.....	do.....	3 8 0
1852	Richard Stratton.....	Self.....	Short-horn ox.....	4 10 0
1853	do.....	Self.....	Short-horn steer.....	3 9 5
1854	Duke of Rutland.....	Self.....	Short-horn ox.....	4 4 0
1855	Marquis of Exeter.....	John Passmore.....	Short-horn steer.....	3 10 0
1856	William Heath.....	Self.....	Devon ox.....	4 5 0
1857	Edward Wortley.....	Self.....	Short-horn steer.....	3 10 6
1858	Richard Stratton.....	Self.....	do.....	2 8 21
1859	Richard Shirley.....	Self.....	Hereford steer.....	2 6 27
1860	It. W. Baker.....	Self.....	Short-horn cow.....	3 8 0
1861‡	George Taylor.....	Christopher Clark.....	do.....	2 11 7

* The gold medal in 1830 was offered by Mr. Kiteles.

† After this year (1842) the gold medals were awarded to the exhibitors instead of the breeders.

‡ After this year (1844) two gold medals were given—one for the best steer or ox, and one for the best heifer or cow.

§ After this year (1861) a silver cup value £40 was submitted for the gold medal.

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*After
given.
†After
given.
‡After
given.

SILVER CUPS FOR STEER OR OX.

Year.	To exhibitor.	Breeder.	Breed.	Age.
1862	John Overman.....	Self.....	Devon and Short-horn.....	y. m. d.
1863	William Heath.....	Thomas Lockley Meir.....	Hereford ox.....	3 4 0
1864	John Walesey Kirkham.....	Luke Harrison.....	Short-horn steer.....	4 0 0
1865	Duke of Sutherland.....	Dr. McGillivray.....	Scotch-horn ox.....	5 8 0
1866	Richard Heath Harris.....	Alexander Cowie.....	Short-horn and Scotch-poll.....	4 8 0
1867	William McOmble.....	Self.....	Scotch-poll.....	4 8 0
1868	William Heath.....	Late Thomas Elesmere.....	Hereford ox.....	4 3 0
1869	Earl of Aylesford.....	Self.....	Devon ox.....	4 3 0
1870	William Taylor.....	R. Stranger.....	Short-horn steer.....	3 2 8
1871	Joseph Stratton.....	The 1. to Rich'd Stratton.....	Short-horn ox.....	4 6 0
1872	James Bruce.....	John Mac'herson.....	Polled Aberdeenshire steer.....	4 3 0
1873	J. S. Bult.....	Self.....	Short-horn ox.....	3 8 11
1874	do.....	Self.....	Short-horn steer.....	3 2 3
1875	G. Sowerby.....	Self.....	Short-horn ox.....	4 2 0
1876	Samuel Kidner.....	Self.....	Devon ox.....	4 1 1
1877	H. R. H. the Prince of Wales.....	William Shapland.....	Devon steer.....	3 2 0
1878	James S. Bult.....	Self.....	Short-horn steer.....	3 11 0
1879	Henry D. Adamson.....	James Bruce.....	do.....	3 5 3
1880	J. J. Colman, M. P.....	James Durno.....	Cross steer.....	3 7 18
1881	Sir W. G. Gordon-Cumming, Bart.....	G. Williamson.....	Scotch-poll steer.....	2 8 6

GOLD MEDALS FOR HEIFER OR COW (BEST IN THE CLASSES.)

1845	William Trinder.....	Lord Sherborne.....	Durham heifer.....	3 10 0
1846	John Booth.....	Self.....	Durham cow.....	9 10 0
1847	Earl of Radnor.....	Self.....	Hereford and Long-horn cross heifer.....	2 8 0
1848	John Mann.....	Self.....	Durham cow.....	9 0 0
1849	Samuel Wiley.....	Self.....	Short-horn cow.....	7 2 0
1850	Stephen Gooch.....	Nathaniel Cartwright.....	do.....	5 3 0
1851	Samuel Druce.....	Self.....	Short-horn and Hereford cross heifer.....	3 4 14
1852	J. D. Cook.....	Self.....	Hereford cow.....	6 11 0
1853	Henry Smith.....	William Smith.....	Short-horn cow.....	5 8 9
1854	Charles Towneley.....	Alexander Bannerman.....	do.....	6 8 0
1855	Henry Ambler.....	W. D. Manning (the late).....	do.....	7 11 16
1856	Richard Stratton.....	Self.....	do.....	5 8 9
1857	Lieut. Col. Towneley.....	Self.....	do.....	4 1 0
1858	J. W. Brown.....	Self.....	Short-horn heifer.....	3 10 21
1859	Lieut. Col. Towneley.....	Self.....	do.....	3 7 2
1860	Richard Hill.....	Self.....	Hereford cow.....	5 2 0
1861	John Faulkner.....	Sir J. Harper Crewe, Bt.....	Short-horn cow.....	5 19 0

SILVER CUPS FOR HEIFER OR COW.

1862	Robert Tennant.....	Self.....	Short-horn heifer.....	3 6 10
1863	Charles Swaisland.....	Lady Lubbock.....	do.....	2 10 0
1864	Richard Taylor.....	Self.....	do.....	3 8 21
1865	Earl of Radnor.....	Self.....	Short-horn heifer.....	3 8 0
1866	Richard Stratton.....	Self.....	Short-horn cow.....	4 10 14
1867	Henry Bettridge.....	E. Tanner.....	Hereford heifer.....	3 0 0
1868	Earl of Hardwicke.....	Self.....	Short-horn heifer.....	3 5 21
1869	Sir W. C. Trevelyan, Bt.....	Self.....	Short-horn cow.....	5 3 21
1870	Trevor L. Senior.....	Late Charles Gibbs.....	Devon heifer.....	2 6 0
1871	James Bruce.....	Alexander Paterson.....	Scotch-poll heifer.....	3 8 14
1872	Trevor L. Senior.....	Walter Farthing.....	Devon heifer.....	3 4 3
1873	John Walter, M. P.....	Hy. Mickleth.....	Short-horn heifer.....	3 2 0
1874	Richard Stratton.....	Self.....	do.....	2 9 0
1875	William Fox Beaven.....	Self.....	do.....	3 0 0
1876	Joseph Stratton.....	Self.....	do.....	3 11 0
1877	N. Catchpole.....	Self.....	do.....	3 7 0
1878	Richard Stratton.....	Self.....	do.....	3 10 14
1879	do.....	Self.....	do.....	3 7 19
1880	Charles Thomas Lucas.....	Self.....	do.....	3 6 0
1881	Sir W. G. Gordon-Cumming, Bart.....	Self.....	Scotch-poll heifer.....	2 8 0

*After this year (1864) a gold medal to the breeder was substituted for the silver medal hitherto given.

†After this year (1861) a silver cup value £40 was substituted for the gold medal.

‡After this year (1864) a gold medal to the breeder was substituted for the silver medal hitherto given.

SILVER CUPS FOR SHROPSHIRE, OXFORDSHIRE, CROSS-BRED, OR ANY OTHER BREED NOT BEFORE SPECIFIED (BEST PEN OF WETHERS IN THE CLASSES).

Year.	To exhibitor.	Breeders.	Breed.	Age.
1862	Zachariah W. Stilgoe.....	Self.....	Sussex and Cotswold.....	m. w.
1863	John Overman.....	Self.....	Leicester and South-down.....	21 3
1864	do.....	Self.....	do.....	20
1865	Duke of Marlborough.....	Self.....	Oxfordshire-down.....	20
1866	John Overman.....	Self.....	Leicester and South-down.....	21
1867	Samuel Druce.....	Self.....	Oxfordshire.....	21 2
1868	Alfred Rogers.....	Self.....	do.....	21 2
1869	John Overman.....	Self.....	Long Wool and South-down.....	21 2
1870	do.....	Self.....	do.....	21 2
1871	Lord Chesham.....	Self.....	Shropshire wethers.....	21
1872	Duke of Marlborough.....	Self.....	Oxfordshire wethers.....	21
1873	do.....	Self.....	Oxford wethers.....	21

CHAMPION PLATE (VALUE £105) TO EXHIBITOR OF BEST BEAST IN THE SHOW.

1869	Earl of Aylesford.....	Self.....	Short-horn steer.....	3 2 8
1870	Thomas Palmer.....	Self.....	Short-horn ox.....	3 9 0
1871	Joseph Stratton.....	The late R. D. Stratton.....	do.....	4 3 0
1872	James Bruce.....	John MacPherson.....	Polled Aberdeenshire steer.....	3 8 11
1873	John Walter, M. P.....	Hy. Micklem.....	Short-horn heifer.....	3 2 0
1874	H. R. H. The Prince of Wales.....	Hugh Aylmer.....	Short-horn cow.....	4 5 0
1875	Thomas Willis.....	Self.....	do.....	4 7 0
1876	Samuel Kidner.....	Self.....	Devon ox.....	4 1 1
1877	N. Catchpole.....	Self.....	Short-horn heifer.....	3 7 0
1878	Richard Stratton.....	Self.....	do.....	3 10 11
1879*	James John Kitchell.....	Self.....	do.....	3 4 0
1880	J. J. Colman, M. P.....	James Durno.....	Cross steer.....	2 7 16
1881	Sir W. G. Gordon-Cumming, Bart.....	Self.....	Scotch-polled heifer.....	2 8 0

*After the year 1879 the club's gold medal was given to the breeder.

CUP PRIZES FOR BEST OF EACH BREED.

[Breed cups, value £40 each, to the exhibitor of the best beast of each breed.]

Year.	Exhibitor.	Breeder.	Breed.	Age.
1874	T. L. Senior.....	Richard Stranger.....	Devon.....	J. m. d.
	Richard Hill.....	Self.....	Hereford.....	4 0 0
	James S. Bult.....	Self.....	Shorthorn.....	3 2 3
	John Kent.....	William Wood.....	Sussex.....	3 7 0
	Sir W. Gordon-Cumming.....	W. Webster.....	Highland.....	4 10 20
	Henry Humphrey.....	Sir C. Goring.....	Cross.....	3 11 0
	Benj. Brown.....	Self.....	Norfolk polled.....	5 8 0
1875	T. L. Senior.....	Richard Stranger.....	Devon.....	5 0 0
	William Groves.....	Messrs. Heighway & Son.....	Hereford.....	3 1 0
	Thomas Willis.....	Self.....	Short-horn.....	4 7 0
	William Wood.....	Self.....	Sussex.....	4 9 0
	Duke of Sutherland.....	Self.....	Scotch Highland.....	5 7 0
	Thomas Statter.....	George Shand.....	Cross.....	5 4 0
1876	Samuel Kidner.....	Self.....	Devon ox.....	4 1 1
	Robert Wortley.....	Thomas Lowe.....	Hereford ox.....	4 3 0
	Joseph Stratton.....	Self.....	Short-horn heifer.....	3 11 0
	William McCombie.....	James Barron.....	Sussex.....	4 6 0
	James Reid.....	James Merson.....	Scotch polled ox.....	3 9 0
1877	H. R. H. The Prince of Wales.....	William Shapland.....	Cross steer.....	3 2 0
	Henry Page.....	D. Edwards.....	Devon steer.....	4 2 0
	Nathaniel Catchpole.....	Self.....	Hereford ox.....	3 7 0
	Alfred Agate.....	Self.....	Shorthorn heifer.....	3 2 0
	Sir W. Gordon-Cumming.....	The late Alex. Paterson.....	Sussex steer.....	3 10 0
	Lord Lovatt.....	Wm. Brown of Linkwood & Aberdeen.....	Scotch polled heifer.....	3 10 0
1878	John Robert Overman.....	Mrs. Clark.....	Shorthorn steer.....	3 10 0
	Robert Wortley.....	J. U. Farmer.....	Devon steer.....	3 4 7
	Richard Stratton.....	Self.....	Hereford ox.....	4 3 21
	John Woodruff.....	John Kirkpatrick.....	Shorthorn heifer.....	3 10 11
			Sussex steer.....	3 9 0

ANY OTHER BREED
CLASSES).

	Age.	m.	wt.
Gold.....	20	3	
South-down.....	20		
.....	20		
n.....	21		
South-down.....	20		
.....	21		2
South-down.....	21		2
.....	21		2
ers.....	21		
ers.....	21		
.....	21		

IN THE SHOW.

3	2	8
3	9	0
4	3	0
3	8	1
3	2	0
4	5	0
4	7	0
4	1	1
3	7	0
3	10	14
3	4	0
3	7	16
2	8	0

eder.

[b breed.]

	Age.
.....	4 0 0
.....	1 1 1
.....	3 2 3
.....	3 7 0
.....	4 10 20
.....	3 11 0
.....	5 8 0
.....	5 0 0
.....	3 1 0
.....	4 7 0
.....	3 7 0
.....	4 1 0
.....	4 1 1
.....	4 3 0
.....	3 11 0
.....	4 6 0
.....	3 9 0
.....	3 2 0
.....	4 2 0
.....	3 7 0
.....	4 1 0
.....	3 10 0
.....	3 16 0
.....	3 4 7
.....	4 3 21
.....	3 10 14
.....	3 9 0

CUP PRIZES FOR BEST OF EACH BREED—Continued.

Year.	Exhibitor.	Breeders.	Breed.	Age.
1878	Sir W. Gordon-Cunningham.	George Williamson.....	Scotch polled ox	<i>y. m. d.</i> 4 3 0
	George Shand.....	Self.....	Cross.....	3 8 0
1879	John Walter, M. P.....	Samuel Kidner.....	Devon ox.....	4 0 25
	Mrs. Edwards.....	Self.....	Hereford cow.....	4 3 20
	Richard Stratton.....	Self.....	Shorthorn heifer.....	8 7 19
	John Kirkpatrick.....	Self.....	Sussex steer.....	3 7 16
	Sir W. Gordon-Cunningham.	C. Grant.....	Scotch polled steer.....	3 7 16
	Lord Lovat.....	William Kelman.....	Cross steer.....	2 6 7
1880	John Walter, M. P.....	Self.....	Devon steer.....	2 11 23
	Frederick Platt.....	Self.....	Hereford steer.....	3 4 23
	Charles Thomas Lucas.....	Self.....	Shorthorn heifer.....	3 6 0
	John Stewart Galey.....	Self.....	Sussex heifer.....	3 6 0
	J. J. Colman, M. P.....	Peter Beattie.....	Scotch polled.....	2 8 16
	J. J. Colman, M. P.....	James Durno.....	Cross steer.....	3 7 16
1881	John Walter, M. P.....	Walter Farthing.....	Devon heifer.....	3 0 29
	Lewis Loyd.....	Self.....	Hereford heifer.....	3 1 29
	W. S. Gibbs.....	Self.....	Shorthorn cow.....	4 10 7
	Alfred Agate.....	Self.....	Sussex heifer.....	5 5 13
	Sir W. Gordon-Cunningham.	Self.....	Scotch polled heifer.....	2 8 0
	Sir John Swinburne, Bt.....	Self.....	Cross-bred steer.....	2 4 0

MILK RECORD OF BRITISH COWS.

(Inclosure 15 in Consul-General Merritt's report.)

Daily yield of milk (in quarts) from sixty cows during twelve months.

No.	Name.	First month.	Second month.	Third month.	Fourth month.	Fifth month.	Sixth month.	Seventh month.	Eighth month.	Ninth month.	Tenth month.	Eleventh month.	Twelfth month.	Daily average over whole period in milk.	During months.
1	Victoria, second prize, Dairy Show, 1878.....	18.5	14.5	11.0	11.0	9.5	8.0	7.5	7.0	6.0	5.5	5.0	2.5	11.53	12
2	Primrose.....	18.5	19.0	17.0	13.0	11.5	11.5	9.5	8.5	8.5	8.5	.....	7.0	8.84	12
3	Jones.....	18.0	20.0	16.0	14.0	11.0	11.0	8.5	4.5	.....	.....	.....	.....	12.87	8
4	Shortlegs.....	16.0	16.0	14.0	14.0	12.5	9.0	9.0	7.5	3.0	2.0	.....	.....	10.3	10
5	Hereford.....	17.0	17.0	14.0	13.0	11.5	11.0	11.0	9.0	7.0	5.0	2.0	.....	10.68	11
6	Red Cheeks.....	16.5	15.5	14.0	13.0	12.3	11.0	12.0	10.0	8.0	3.5	1.0	.....	10.68	11
7	Faction.....	18.5	14.5	12.5	12.0	10.0	9.0	.....	6.0	6.0	.....	.....	.....	10.36	9
8	Champion.....	19.0	15.5	14.5	12.0	11.0	10.0	11.5	10.5	8.0	8.0	7.5	7.0	9.0	16
9	Barry.....	14.5	16.5	12.5	13.0	12.5	12.0	12.0	9.5	8.5	8.0	7.5	7.0	9.0	17
10	Dasher.....	18.0	15.0	13.0	11.5	10.5	9.5	9.0	3.5	1.0	.....	.....	.....	10.55	9
11	Cowslip.....	18.5	14.5	15.0	13.0	12.5	10.0	10.0	9.0	8.5	8.5	7.0	6.0	10.88	11
12	Charmer.....	21.0	16.5	16.0	15.0	15.0	11.0	10.5	9.0	7.5	7.0	7.5	6.0	10.06	16
13	Jones.....	18.5	16.5	15.0	13.5	12.0	11.0	10.5	9.0	7.0	6.5	6.0	5.5	8.64	17
14	Grenade 6th.....	17.0	14.0	12.0	10.0	9.5	9.5	8.0	6.0	2.0	.....	.....	.....	9.77	9
15	Loosely.....	19.0	15.5	14.0	12.0	10.5	10.5	8.5	8.0	7.0	4.0	3.0	.....	10.38	9
16	Cockhorn.....	17.0	19.0	16.0	14.5	13.0	13.0	12.0	11.5	8.5	10.0	7.0	.....	12.15	17
17	Sandwich.....	18.0	18.0	14.0	12.0	10.5	10.5	9.0	9.5	7.5	6.5	6.5	5.0	10.15	18
18	Meadow Flower 14th (dam of first prize Chippenham).....	20.0	20.0	18.0	15.5	13.5	13.5	11.0	9.0	5.0	3.5	2.0	.....	11.86	11
19	Hereford (Cox's).....	20.0	17.5	17.5	14.5	14.0	12.5	9.5	8.0	3.5	.....	.....	.....	12.94	6
20	Blossom.....	18.0	22.0	19.0	17.0	16.0	13.0	12.0	9.0	9.5	8.0	7.0	5.5	13.83	12
21	Winney.....	19.0	18.0	17.0	14.0	14.0	12.0	10.0	9.0	6.5	1.5	.....	.....	11.8	10
22	Cherry.....	20.0	19.0	18.0	16.0	13.0	11.5	14.0	9.0	4.0	4.0	.....	.....	12.8	10
23	Hereford (Cornish's).....	20.5	19.0	18.0	18.0	15.5	13.5	11.5	10.5	6.0	.....	.....	.....	14.61	6
24	Tiohorn.....	16.0	14.0	13.0	12.0	11.5	11.0	9.5	7.5	7.0	7.0	5.5	.....	10.36	11
25	Hereford (old).....	23.0	22.0	22.0	18.0	16.5	16.0	11.0	12.5	12.0	8.0	4.0	.....	15.0	11
26	Noble.....	17.0	16.5	17.5	15.0	11.0	12.5	10.5	8.5	8.5	.....	.....	.....	13.33	6
27	Fair Maid (second prize, Croydon, 1880).....	17.0	16.0	13.0	11.0	9.5	10.0	7.5	8.5	7.5	6.5	4.0	.....	10.04	11
28	Primrose.....	19.5	18.5	17.0	16.5	14.5	12.5	4.5	.....	.....	.....	.....	.....	14.71	7
29	Darling.....	17.0	16.0	15.0	12.5	12.5	13.5	12.5	10						
30	Lily.....	17.0	16.0	15.0	12.0	10.5	10.5	12.5	10.0	8.5	11.5	9.0	6.0	14.04	13
31	Champion.....	20.0	19.0	17.0	15.5	14.5	14.0	12.5	13.5	9.5	8.5	.....	.....	10.50	15
32	Dropchorn.....	17.5	16.5	15.0	15.0	13.5	13.5	10.0	.....	.....	.....	.....	.....	14.4	10
33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13.0	10

Milk record—Continued.

No.	Name.	First month.	Second month.	Third month.	Fourth month.	Fifth month.	Sixth month.	Seventh month.	Eighth month.	Ninth month.	Tenth month.	Eleventh month.	Twelfth month.	Daily average over whole period in milk.	During months.
33	Lady.....	17.0	15.5	13.0	10.5	10.5	10.5	8.5	7.0	.....	.....	.....	.....	11.56	8
34	Bride.....	18.0	19.0	18.0	12.0	13.5	13.5	12.5	10.5	10.0	9.5	7.5	.....	13.09	11
35	Peasant.....	18.0	16.0	16.5	15.5	15.0	14.5	12.5	14.5	11.5	10.5	9.0	5.0	13.20	12
36	Pearl 10th.....	16.5	13.5	12.5	12.0	10.0	8.5	7.5	7.5	6.5	6.5	.....	.....	10.25	10
37	Henrietta 17th.....	18.0	13.0	12.0	12.0	10.0	8.5	8.5	5.5	4.5	.....	.....	.....	10.0	9
38	Cornish.....	20.0	20.0	17.0	14.5	15.0	11.5	9.5	10.0	.....	.....	.....	.....	14.68	8
39	Shortlegs.....	22.0	21.5	21.5	15.5	8.5	6.5	8.0	7.0	6.0	4.5	.....	.....	12.1	10
40	Minnie.....	18.0	17.0	15.0	14.0	13.5	13.5	12.0	9.5	.....	4.5	.....	.....	10.09	16
41	Infanta.....	20.0	21.0	18.0	14.0	13.0	8.5	7.5	7.0	6.0	5.0	6.5	8.0	12.00	10
42	Bailey.....	19.0	16.0	19.5	18.0	17.0	15.0	11.0	10.5	8.0	2.5	.....	.....	13.65	10
43	Ariel 3d.....	15.5	12.5	11.5	10.5	7.5	7.0	7.0	5.5	5.5	5.0	3.5	.....	8.35	11
44	Venus 3d.....	17.5	16.0	14.0	11.5	10.5	10.5	9.5	9.5	8.5	6.5	4.5	.....	11.04	11
45	Sandy.....	14.5	15.5	12.5	12.0	11.5	11.0	9.0	8.0	7.5	6.5	2.5	.....	10.04	11
46	Brindle.....	16.0	13.5	10.5	9.5	9.0	7.5	5.5	4.5	4.0	.....	.....	.....	8.88	11
47	Brownie.....	16.5	15.5	13.5	13.5	10.5	8.5	7.0	6.0	5.5	4.0	2.5	.....	9.36	11
48	Moreton.....	17.5	16.0	14.0	11.5	11.0	9.0	7.0	5.0	.....	.....	.....	.....	11.37	8
49	Cherrywhite.....	18.0	17.5	15.0	14.5	14.0	11.0	10.0	7.0	6.5	5.5	.....	4.0	10.37	12
50	Ruby.....	16.5	15.5	13.5	11.0	10.5	9.5	5.5	.....	.....	.....	.....	.....	11.57	7
51	Venus 2d.....	18.0	17.0	15.0	15.0	14.0	12.5	10.5	9.5	5.5	2.5	.....	.....	11.00	10
52	Minikin.....	19.0	15.5	12.0	12.0	12.0	10.0	5.5	1.0	.....	.....	.....	.....	10.0	10
53	Betts.....	16.0	15.5	13.5	13.0	12.0	11.0	9.5	8.0	7.0	6.5	.....	.....	11.2	9
54	Star.....	16.0	14.5	12.0	13.0	12.0	9.5	6.5	3.0	.....	.....	.....	.....	10.81	8
55	Dunapling.....	19.0	18.0	15.0	14.0	13.5	13.0	10.0	7.5	.....	.....	.....	.....	12.55	10
56	Infant.....	22.5	17.5	17.5	15.5	13.5	12.5	11.0	11.0	11.0	7.5	7.0	.....	13.91	11
57	Charmar (dam of first prize, I-lington, 1879).....	20.0	25.0	25.0	23.5	20.5	20.5	14.0	12.0	12.0	11.0	12.5	8.0	17.0	12
58	Stoppa.....	17.0	16.5	14.0	12.0	10.5	9.5	5.5	3.5	.....	.....	.....	.....	11.06	8
59	Stag.....	21.0	22.0	22.0	22.0	20.0	17.5	15.5	12.5	10.0	8.5	7.0	7.5	14.14	14
60	Naney.....	19.0	18.5	15.0	15.0	15.5	12.0	11.0	9.0	8.0	6.5	8.5	5.5	10.92	14
Average of sixty cows.....		18.0	17.09	15.03	13.75	12.55	11.34	9.72	7.94	6.01	4.67	3.05	1.85	11.5	10.83

THE POSITION OF ENGLISH DAIRY FARMING IN 1893.

[Inclosure 16 in Consul-General Merritt's report.]

The marvelous changes and improvements which have arisen during the last decade in the manufacture and disposal of the products of the dairy can scarcely be realized, even by the active participants in the movement, casting a retrospective glance at the general depression of the dairy interests throughout the country so recently as 1869, when the factory system of cheese-making was first introduced into England. Prior to this except in a few favored localities contiguous to populous centers where new milk could be delivered twice a day to the hucksters who retailed it over the counter, there being then no organized system of delivery, those living outside the area of this charmed circle were compelled to convert the chief of their milk into cheese. It is true they reared a few calves, made a little butter from the whey feedings, and a light skimming from one meal, in order, as was alleged, to prevent the cheese from falling to pieces. In most cases the cheese had to be made in the kitchen, which was often inconvenient and ill-adapted for the purpose. The accommodation for storing and ripening the cheese was generally of a defective character, hence the produce was variable in quality and meager in quantity.

The Derbyshire landlords and others who contributed the funds and devoted much time and energy in experimental dairying, the pioneers who contributed the funds and undertook the labor, have received scant recognition of their philanthropic efforts at the hands of the public. The system was ignored by some and ridiculed by others; yet it accomplished all its most sanguine advocates ever anticipated, which was to raise the inferior qualities to the level of first-class brands. Taking the average price of cheese made in a 300-cow dairy, and comparing them with an equal quantity made indiscriminately in farmhouse dairies, the uniform quantity of the large make gives them a great advantage in the market. Although the system has not expanded so rapidly as was imagined, it is not due to any inherent imperfection, but to a combination of circum-

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stances having directed the raw material into new channels. Previous to the factory movement, all statistics as to the yield of milk and its product was meager and unreliable. The more business-like method of dealing with milk by weight, and the weighing of the cheese from the press, showed at a glance the quantity of green cheese produced by a gallon of milk throughout the year. Having ascertained this, the shrinkage or loss of weight in ripening was easily calculated; the cost of labor, salt, and other materials used in the manufacture was correctly ascertained, and the value of the waste products correctly appraised.

Another important lesson to the dairy farmer was the transit of milk for long distances. The Derbyshire milk trade to London, and other large towns, dates contemporaneously with the introduction of the factory. In 1869 there was no milk sent from Derby to London. Now, in the height of the season, the quantity sent by the Midland Railway alone we estimate at 20,000 gallons a day. During the earlier development of the milk trade many losses occurred to the farmers, generally through an imperfect knowledge of the position of the middle men, many of whom were needy adventurers, who, by fair promises and the offer of an extra half-penny per gallon, imposed on the good-natured credulity of the farmers, who allowed their accounts to run on and were frequently mulcted in large sums. The old adage "once bit, twice shy," has led to more careful inquiries as to the respectability and solvency of the purchaser. Weekly, fortnightly, and, at the utmost, monthly payments are now the rule. Yearly contracts are common with a varying scale of prices and quantities for the different seasons. Although the prices of milk have not generally improved, the trade on the whole has assumed a more settled form.

IMPROVEMENT IN THE BREED OF DAIRY CATTLE.

The various grades of Shorthorn comprise four-fifths of the cattle kept exclusively for dairy purposes in the Midland and West Midland counties, and as milk and meat producers they cannot be surpassed. Their size, quality, and aptitude to lay on flesh quickly has been immensely improved by the use of pure-bred bulls. Where these have been selected with judgment, the milking capabilities have likewise increased. A much greater degree of care and attention is exercised in the selection of cows suitable for the dairy. A well-shaped milk vessel is a point on which dairy farmers are becoming more critical. Inferior milkers are weeded out, and either passed on to the grazier or fattened off on the farm. The chief obstacle to more rapid improvement of the ordinary stock of the dairy districts is due to a parsimonious and grudging spirit in securing the services of a better class of bulls. A man with a dairy of 30 to 50 cows will give £30 for a young Shorthorn bull, which, after three years' service and three months' stall-feeding, will readily make £35 to £40 to the butcher. The stock left by him will be a remarkable improvement on the original. Instead of exercising more care in the selection of another pure-bred animal to follow, he saves a calf from some favorite cow in his own herd, which, being only a half-bred, reduces the progeny to their original state.

The milk-selling mania, which set in about 1873-'74 and culminated in 1880-'81, completely demoralized the dairy interests of the Midlands. The best men were realizing an average return of £22 to £26 per cow by the sale of milk. On all the best milk farms rearing was for the time completely ignored; the capabilities of farms were taxed to the uttermost in order to produce the greatest possible quantity of milk, the farmers preferring to purchase springing cows to fill up their stalls as required. In the course of three years the system began to tell in the scarcity and enhanced prices of calving cows. The diminution, so to speak, of the cattle population of this country is largely due to the same cause. For the last two years the enhanced prices and inferior quality of the stock has reduced the profits of dairy farming to a small margin. Stock reared on the farm are more healthy and thrive better than strangers, and these are frequently of a nondescript character. Instances are numerous of cows purchased at £24 to £26, after being milked 10 or 11 months, selling as barreners at £16 or £18 each. This makes a rather heavy inroad on the gross returns. The very few men who have quietly gone on rearing sufficient to keep up their herd and finished off their cast cows have suffered little from the pressure of the time. This year the rage for rearing has again set in; colory calves of a few days old have been eagerly picked up at 40s. to 50s. each. We have a commission to purchase all the bull calves from a herd of 40 ordinary dairy cows at 60s. each, delivered on rail at three days old. I need scarcely say they were all by a pedigree bull. Such prices should be sufficient inducement to use a better class of sires.

IMPROVED METHODS OF FEEDING.

The great impetus given to dairy farming by the introduction of the factory system, and subsequently the sale of milk, has led to a much more liberal system of feeding. Formerly the produce of the farm, grass in summer and hay in winter, constituted the

Eleventh month.	Twelfth month.	Daily average over whole period in milk.	During months.
7.5		11.56	
9.0	5.0	13.09	
		13.29	
		10.25	
		10.0	
		14.08	
6.5	8.0	12.1	
		12.0	
3.5		13.65	
4.5		8.35	
2.5		11.04	
		10.04	
		8.88	
3.5	4.0	9.36	
		11.37	
		10.37	
		11.57	
		10.00	
		11.2	
		11.0	
		10.81	
7.0		12.55	
		13.81	
12.5	8.0	17.0	
		11.06	
7.0	7.5	14.14	
8.5	5.5	10.92	
3.05	1.85	11.5	10.83

G IN 1883.

ring the last decade been realized, even at the general average as 1869, when the Prior to this except milk could be der- there being then charmed circle were they reared a few ing from one meal. In most cases the and ill-adapted for e was generally of meager in quantity. and devoted much ted the funds and tropic efforts at the by others; yet it was to raise the in- e price of cheese made indiscrimi- gives them a great so rapidly as was itation of circum-

diet of a dairy cow. Cheese was made during eight or nine months. The cow was put dry and rested for at least three months out of the twelve. With milk-selling the case is entirely changed. The supply must be kept up to a fixed standard throughout the year; hence shelter and artificial food are essential. The cows are now regularly milked to within one month of calving. Little long hay is now used, the food is all given in a prepared state. Large quantities of meal, cake, and brewers' grains are used. During the early days of milk-selling some landlords were alarmed lest the land should become robbed and deteriorated. This contingency has not been realized; on the contrary, large sums are now spent on purchased foods, where, under the old cheese-making régime, not a shilling was spent on extraneous substances.

I may be allowed to quote an instance, within my own knowledge, of an estate of less than 3,000 acres, purely dairy land, where not a ton of cake or other purchased food was ever used. The average output on this estate during the last seven years has been upwards of £2,000. Some of the best men are adopting a modification of the town system. The weak milkers and the more aged are highly fed, and are thus milked and fattened at the same time, and are passed off to the butcher before they are dry. On some of the larger farms a recent improvement is becoming popular. I have fitted up cooking cisterns on several farms. These are constructed of common bricks set in cement, into which is placed a perforated wooden bottom; a pipe from the steam engine delivers the steam into the open space under the false bottom; above, the tank is filled with hay or straw, chaff, or a mixture of the two, with a quantity of unground corn. The cistern is covered by a closely-fitting lid, the steam is turned on, and the contents thoroughly cooked. This has proved to be not only the most economical, as in the case of dairy cows; it is the most efficient method of feeding corn.

YIELD AND VALUE OF MILK.

The improvement of the breed and a more liberal system of feeding have increased the average yield of milk 160 gallons per cow during the last twelve years. The average yield of the best South Derbyshire dairies may be taken at 650 gallons. The popular taste is in favor of a rich, mellow, smooth-flavoured cheese, artificially ripened, at from six weeks to three months old. This is somewhat in favor of the producer, the shrinkage in weight being less than would be the case if kept to a greater age. An imperial gallon of milk at a temperature of 60 degrees weighs 10 pounds 4 ounces; under good management, 11 pounds of milk will produce 1 pound of cured cheese. If we estimate the cost of labor and materials, and allow, on the other side, one halfpenny per gallon for the whey, the cheese must sell at 70s. per cwt. of 120 pounds to realize 7d. per imperial gallon for the crude milk.

Immense improvements have taken place in butter-making since the Bristol meeting of the Royal Agricultural Society in 1879. The Coolley and Swartz systems were there thoroughly tested by English judges, and their merits fully recognized. Both these systems have been completely superseded by the cream separator, which effects a perfect separation in an amazingly rapid manner. The milk is drawn from the cow, passed over a Lawrence refrigerator, and immediately separated at the rate of 60 gallons or more an hour. The perfectly sweet cream is churned immediately, or, as preferred by some, rendered slightly acid, either by natural or artificial means. So rapid is the process that butter from the morning's milk can be placed in the market the same evening. The cream, when removed by the separator, is as free from milk as can possibly be the case by the ordinary method of skimming; hence the butter is finer, being perfectly free from casein. The quality of cream is further shown by the yield of butter. One hundred quarts of cream frequently produce 112 pounds of butter; the average yield of butter throughout the year, in an ordinary farm dairy, is 16 ounces of butter from 11 quarts of new milk. One of the chief advantages of the separator is the enhanced value of the skim milk, which is perfectly sweet, and will keep so for a much longer period than milk which had been set from twenty-four to thirty-six hours, hence it is more valuable either for household purposes or the rearing of stock; its commercial value is 3d. or 4d. per imperial gallon. The butter fat only being removed, the solids remain intact to build up the bone and muscle of the young animal, and the sugar as a heat producer; hence its value for stock-raising. The market price of crude milk varies like other commodities. The best prices are generally obtained from local vendors.

There is still a large field open amongst the mining population of the North Midlands, as well as that of the country villages, who can obtain it only as a luxury. Though sent daily from their own doors in large quantities to London and other large towns, the denizens of the country villages are unable to supply their wants. The prices vary from 7½d. to 8d. for the six summer months and 9½d. to 10d. for the six winter months, per imperial gallon, out of which the farmer has to defray the cost of carriage, which, if sent to London, is 1d. per gallon. Although stringent laws have been placed in the stat-

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ute book as to the legality of certain well-defined weights and measures, nevertheless the old barn gallon of 17 pints is used as a measure of capacity to the mystification and, not unfrequently, the loss of the average countryman. Since the use of cream separators has become more general, the use of new milk amongst the working classes has been gradually falling off. The retail price in London of perfectly sweet and wholesome skim milk is $2\frac{1}{2}d.$ per quart. This cannot fail to prove an inestimable boon to the poorer classes.

THE ADVANTAGES OF THE CO-OPERATIVE FACTORY SYSTEM.

The isolated position and the general circumstances and surroundings of the ordinary dairy farmer seldom lead him into the keen commercial current of modern life, hence he comes more frequently into contact with the middle-man than he does with the consumer. The co-operative principle is specially applicable to modern dairy management, and on all estates of any magnitude factories should be erected and fitted up with the necessary plant for cheese and butter making and milk selling, the tenants paying a moderate rent for the buildings and use of the plant.

On a large scale, it is necessary to have a skillful manager who would act under a general committee of the milk contributors. The association would be hampered by no contracts, and be able at all times to dispose of their produce in the best market. The sale of new milk, cheese-making, or butter-making, and the sale of skim milk, would each be resorted to in order to meet the turn of the markets, so that larger profits might be earned. A constant supervision would insure a more uniform and higher quality than is possible where an equal quantity is made up in separate dairies, with all the disadvantages of inferior plant. Butter factories are on the increase, and the quality of the produce is uniform and vastly superior to the general run of private dairies. To my mind, the chief objection is, they are not conducted on co-operative principles. The milk is purchased at a fixed price, and the farmer has no further interest in the concern.

My employer, the Earl of Harrington, is willing to erect and equip a cheese and butter dairy in the center of a large dairy parish by way of experiment, charging only a nominal rent for the first year or two. There is, however, great diffidence on the part of the tenants to embark in the venture. In order to take full advantage of every fluctuation of the market, one or two condensing pans should be erected in every factory. This insures a complete control over the skim milk, which can either be condensed as plain milk, when it will keep perfectly sweet for six or eight days, and sent to the distant towns and returned to its original state of skim milk by the addition of 85 per cent. of water. This is a palatable and wholesome addition of the food supply of the working classes. The retail price in London is $2\frac{1}{2}d.$ per quart. The skim milk is likewise sweetened by the addition of sugar, condensed and packed in hermetically sealed tins. This will keep for an almost indefinite period. When wanted for use, the tin is opened, and 85 to 87 per cent. of pure water added. The mixture, when well agitated, has the appearance and taste of sweet skim milk. To my mind, the great practical advantages of the cream separator and condensing pan is that the condensed milk, either plain or sweet, is in a portable form, easily conveyed long distances at a cheap rate, and will prove an inestimable boon to the farmer by enabling him to rear his stock at a cheap rate, so that rearing may be successfully practiced on farms which, under ordinary circumstances, would be impracticable. A condensing factory has been started in South Derbyshire. At present the produce is principally sent to the London markets, and as its properties become better known the demand will largely increase.

The yield of butter varies considerably, even from day to day, irrespective of food. The quality and temperature of the drinking water has a marked effect on the health and secretions of the cow. The simple cream-test tubes now in every-day use long puzzled observant managers as to the direct cause of the varying quantities of cream. Close observations and experience have strengthened the conviction that temperature is the great disturbing cause. The same quantity of milk which under a mean atmospheric temperature of 60 degrees will produce 4 pounds 5 ounces of butter, at a temperature of 70 the quantity of butter is reduced to 4 pounds 13 ounces, and at 80 degrees of temperature there is a further falling off in the quantity to 4 pounds 3 ounces; at 50 degrees the butter is increased to 5 pounds 14 ounces. With regard to added water the analysts are frequently at fault. As soon as the milk is drawn from the cow, chemical changes begin to take place, by which new combinations are formed. The solids in their original state vary slightly; the chemical forces, which are constantly at work, are continually building up new structures from the ruins of the old. By this we imply that even where the cows are fairly well kept the milk at certain times may fall far short of the cream standard without a particle of water being added. All milk now sent by rail is passed over a refrigerator and the temperature reduced from 95 degrees (the normal heat when drawn from the cow) to 60 degrees, at which it is usually sent off. This change of temperature

reduces the volume nearly 5 per cent. Although great improvements have been made during the last 10 years in the handling of milk and its products, there is still much to learn before we can pretend to be adepts in the art.

GILBERT MURRAY.

OCTOBER 1, 1883.

THE MILKING TRIALS AT THE DAIRY SHOW.

[Inclosure 16a in Consul-General Morrill's report.]

The following full report of the yields and analyses of milk at the London Dairy Show have been sent to us for publication:

COWS.

Date of calf or kid.	No.	Age.	Day's milk quantity.	Quality of total solids.	Fat.	Total award.
		Years.	lbs. oz.	per cent.		
May 12.....	*17	7½	51 0	12.96	3.85	99.12
September 27.....	*21	5½	47 0	14.20	4.71	92.05
August 17.....	25	5½	27 12	13.11	4.01	63.98
August 20.....	27	5	34 12	13.77	5.30	88.79
September 1.....	30	7½	32 8	13.21	4.20	73.32
July 28.....	44	7½	23 0	13.29	4.11	67.28
August 5.....	*49	5½	26 4	14.21	5.14	81.87
June 28.....	50	4	21 0	14.66	5.08	80.72
April 8.....	*57	7½	18 8	14.25	5.51	87.59
October 3.....	65	7½	30 4	14.18	5.12	79.81
August 8.....	66	4	33 12	13.74	4.92	80.43
July 10.....	*78	7	60 4	12.12	2.80	91.50
July 4.....	*81	4½	26 8	14.75	5.28	87.80
September 27.....	82	5½	51 8	11.48	2.40	68.46

No. 17, Class 1.—Red Cherry (Shorthorn); color, red; age, 7 years 9 months and 1 week; last calf, May 12, 1883; breeder and exhibitor, Mr. J. Phillips (non-pedigree).

Yield of milk, October, 1883: 8.30 a. m., 27 pounds 8 ounces; 7.15 p. m., 23 pounds 8 ounces; total, 51 pounds.

Analysis: Specific gravity, 1.0338; total solids, 12.96; fat, 3.85; solids not fat, 9.11; percentage of cream by volume, 10.

Number of points (1st prize, section No. 1 Champion prize): Quantity, 51; quality, 25.92; time, 13.70; additional fat, 8.50; total, 99.12.

No. 21, Class 2.—Daisy (Shorthorn); color, roan; age, 5 years 6 months; produce, 3 calves; last calf due, per catalogue, September 19; per cowman, September 27, 1883; exhibitor, Mr. Thomas Birdsey (non-pedigree).

Yield of milk, October 3, 1883: 8.30 a. m., 26 pounds 8 ounces; 7.15 p. m., 20 pounds 8 ounces; total, 47 pounds.

Analysis: Specific gravity, 1.0336; total solids, 14.20; fat, 4.71; solids not fat, 9.49; percentage of cream by volume, 11.

Number of points (2d prize, section 1): Quantity, 47.0; quality, 28.4; time, none; additional fat, 17.1; total, 92.5.

No. 25, Class 2.—Honesty (Shorthorn); color, roan; age, 5 years 2 months; produce 3 calves; last calf, per catalogue, August 17, 1883; per cowman, September 27, 1873; exhibitor, Mr. T. Birdsey (non-pedigree).

Yield of milk October 3, 1883: 8.30 a. m., 16 pounds; 7.15 p. m., 11 pounds 12 ounces; total, 27 pounds 12 ounces.

Analysis: Specific gravity, 1.0336; total solids, 13.11; fat, 4.01; solids not fat, 9.10; percentage of cream by volume, 10.5.

Number of points: Quantity, 27.75; quality, 26.22; additional fat, 10.01; total, 63.98.

No. 27, Class 2.—Spot (Shorthorn); color, Sussex brown; age, 5 years; produce, 5 calves; last calf, August 29, 1883; exhibitor, Rev. W. Winlaw (non-pedigree).

Yield of milk October 3, 1881: 8.30 a. m., 19 pounds 8 ounces; 7.15 p. m., 15 pounds 4 ounces; total, 34 pounds 12 ounces.

Analysis: Specific gravity, 1.030; total solids, 13.77; fat, 5.30; solids not fat, 8.47; percentage of cream by volume, 14.

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Fat.	Total award.
3.85	99.12
4.71	92.05
4.01	63.98
5.30	88.79
4.20	73.92
4.11	67.28
5.14	81.87
5.08	80.72
5.51	87.59
5.12	79.81
4.92	80.43
2.80	91.59
5.28	87.40
2.10	68.46

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Number of points: Quantity, 34.75; quality, 27.54; time, 3.50; additional fat, 23.00; total, 88.79.

No. 36, Class 3.—Lady Savage (Jersey); color, silver gray; age, 7 years 4 months; last calf about September 1, 1883; exhibitor, Mr. H. C. Smith (non-pedigree).

Yield of milk October 3, 1883: 8.30 a. m., 18 pounds 8 ounces; 7.15 p. m., 14 pounds; total, 32 pounds 8 ounces.

Analysis: Specific gravity, 1.0326; total solids, 13.21; fat, 4.20; solids not fat, 9.01; percentage of cream by volume, 12.

Number of points: Quantity, 32.60; quality, 26.42; time, 3.00; additional fat, 12.00; total, 73.92.

No. 44, Class 3.—Velveteen (Jersey); color, fawn; age, 7 years 2 months 1 week; produce, 6 calves; last calf, July 28, 1883; breeder, Mr. Le Brocq; exhibitor, Mr. J. Cardus (non-pedigree).

Yield of milk October 3, 1883: 8.30 a. m., 13 pounds; 7.15 p. m., 10 pounds; total, 23 pounds.

Analysis: Specific gravity, 1.0336; total solids, 13.29; fat, 4.11; solids not fat, 9.18; percentage of cream by volume, 12.

Number of points: Quantity, 23.00; quality, 26.58; time, 6.60; additional fat, 11.10; total, 67.28.

No. 49, Class 3.—Little Katie (Jersey); color, lemon fawn; age, 5 years 4 weeks; produce, 3 calves; last calf, August 5, 1883; breeder, Mr. C. B. Dixon; exhibitor, Mr. H. H. A. Rigg (non-pedigree).

Yield of milk October 3, 1883: 8.30 a. m., 14 pounds 12 ounces; 7.15 p. m., 11 pounds 8 ounces; total, 36 pounds 4 ounces.

Analysis: Specific gravity, 1.0316; total solids, 14.21; fat, 5.14; solids not fat, 9.07; percentage of cream by volume, 18.5.

Number of points (2d prize, section 2): Quantity, 26.25; quality, 28.42; time, 5.80; additional fat, 21.40; total, 81.87.

No. 56, Class 4.—Countess (Guernsey); color, lemon and white; age, 4 years 2 weeks; produce, 2 calves; last calf, June 28, 1883; breeder and exhibitor, Mr. W. A. Glynn.

Pedigree: Sire, Billy 1st; dam, Duchess.

Yield of milk October 3, 1883: 8.30 a. m., 12 pounds; 7.15 p. m., 9 pounds; total, 21 pounds.

Analysis: Specific gravity, 1.0324; total solids, 14.66; fat, 5.08; solids not fat, 9.58; percentage of cream by volume, 10.

Number of points: Quantity, 21.00; quality, 29.32; time, 9.60; additional fat, 20.80; total, 80.72.

No. 57, Class 4.—Gentle (Guernsey); color, lemon and white; age, 7 years 2 months; produce, 5 calves; last calf, April 8; breeder and exhibitor, Mr. W. A. Glynn.

Pedigree: Sire, Johnny 2d; dam, Fairy 1st.

Yield of milk October 3, 1883: 8.30 a. m., 11 pounds; 7.15 p. m., 7 pounds 8 ounces; total, 18 pounds 8 ounces.

Analysis: Specific gravity, 1.0316; total solids, 14.25; fat, 5.54; solids not fat, 8.71; percentage of cream by volume, 7.5.

Number of points (1st prize, section 2): Quantity, 18.50; quality, 28.50; time, 15.10; additional fat, 25.40; total, 87.50.

No. 65, Class 5.—Lady Flora (Ayrshire); color, brown and white; age, 4 years 6 months; last calf, October, 1882; exhibitor, Mr. G. Ferme (non-pedigree).

Yield of milk, October 3, 1883: 8.30 a. m., 16 pounds 8 ounces; 7.15 p. m., 13 pounds 12 ounces; total, 30 pounds 4 ounces.

Analysis: Specific gravity, 1.0326; total solids, 14.18; fat, 5.12; solids not fat, 9.06; percentage of cream by volume, 12.

Number of points: Quantity, 30.25; quality, 28.36; additional fat, 21.20; total, 79.81.

No. 66, Class 5.—Pride of Leigham Lodge (Ayrshire); color, brown and white; age, 4 years; last calf, by certificate, August 8, 1883; exhibitor, Mr. G. Ferme (non-pedigree); disqualified.

Yield of milk, October 3, 1883: 8.30 a. m., 18 pounds 12 ounces; 7.15 p. m., 15 pounds; total, 33 pounds 12 ounces.

Analysis: Specific gravity, 1.0312; total solids, 13.74; fat, 4.92; solids not fat, 8.82; percentage of cream by volume, 15.

Number of points: Quantity, 33.75; quality, 27.48; additional fat, 19.20; total, 80.43.

No. 78, Class 7.—Magpie (cross, sire Shorthorn, dam Dutch); color, black and white; age, 7 years; last calf, July 10, 1883; exhibitors, Messrs. J. Rumbal and Son (non-pedigree).

Yield of milk, October 3, 1883: 8.30 a. m., 31 pounds 4 ounces; 7.15 p. m., 29 pounds; total, 60 pounds 4 ounces.

Analysis: Specific gravity, 1.0334; total solids, 12.12; fat, 2.86; solids not fat, 9.26; percentage of cream by volume, 9.

Number of points (1st prize, section 3): Quantity, 60.25; quality, 24.24; time, 8.50; less deficiency in fat, 1.40; total, 91.59.

No. 81, Class 9.—Myrtle 7th (Devon); color, red; age, 4 years 5 months 3 weeks; produce, 2 calves; last calf, July 4, 1883; breeder and exhibitor, Mr. A. C. Skinner.

Pedigree: Sire, Duke of Farrington (1323); dam, Myrtle 1st (4765); by Squire Winter (1453).

Yield of milk, October 3, 1883: 8.30 a. m., 15 pounds 8 ounces; 7.15 p. m., 11 pounds; total, 26 pounds 8 ounces.

Analysis: Specific gravity, 1.0336; total solids, 14.75; fat, 5.28; solids not fat, 9.47; percentage of cream by volume, 3.

Number of points (2d prize, section 3): Quantity, 26.50; quality, 29.50; time, 9.00; additional fat, 22.80; total, 87.80.

No. 82, Class 9.—Dairymaid (cross, sire Shorthorn, dam Dutch); color, blue and white; age, 5 years 6 months; produce, 2 calves; last calf, September 27, 1883; exhibitor, Mr. T. Birdsey (non-pedigree).

Yield of milk, October 3, 1883: 8.30 a. m., 27 pounds 8 ounces; 7.15 p. m., 24 pounds; total, 51 pounds 8 ounces.

Analysis: Specific gravity, 1.0336; total solids, 11.48; fat, 2.40; solids not fat, 9.08; percentage of cream by volume, 8.25.

Number of points: Quantity, 51.50; quality, 22.96; total, less 6.00 for deficiency of fat, 68.46.

GOATS.

No. 171, Class 24.—Kitty; breed, horned goat (short-haired), Nubian and British; color, brown and white; age, 7 years; last kid, July 13, 1883; exhibitor, Mr. E. T. Crookenden (non-pedigree); disqualified.

Yield of milk, October 3, 1883: 8.30 a. m., 1 pound 8 ounces; 7.15 p. m., 1 pound 4 ounces; total, 2 pounds 12 ounces.

Analysis: Specific gravity, 1.032; total solids, 14.69; fat, 4.00; solids not fat, 9.79.

No. 289, Class 25.—Nancy (horned goat), long-haired; color, black and white; age, 7 years; produce, 7 kids; last kid, July 3, 1883; exhibitor, Mr. Nixon.

Yield of milk, October 3, 1883: 8.30 a. m., 2 pounds 2 ounces; 7.15 p. m., 2 pounds 4 ounces; total, 4 pounds 6 ounces.

Analysis: Specific gravity, 1.032; total solids, 12.39; fat, 3.34; solids not fat, 9.05.

Number of points (1st prize): Quantity, 4.37; quality, 24.78; total, 29.15.

CENTRAL CHAMBER OF AGRICULTURE.

(Inclosure 166 in Consul-General Merritt's report.)

Chairman: Thomas Duckham, esq., M. P. Vice-Chairman: Henry Chaplin, esq., M. P. Secretary: Major Craigie.

Chamber.	Secretary.	Vote.
Banbury district.....	W. T. Warner, 59 Middleton road, Grimsbury, Banbury.....	1
Bedale.....	J. Teale, solicitor, Bedale.....	1
Berks and Oxon Association.....	J. Neale, 24 Friar street, Reading.....	1
Brecknockshire.....	Rhys Davies, 8 Lion street, Brecon.....	1
Buckinghamshire.....	George Fell, Aylesbury.....	4
Cambridgeshire and Isle of Ely.....	R. Peters, jr., 7 Downing street, Cambridge.....	2
Cheshire.....	Thomas Rigby, Sutton Weaver, Preston Brook, Cheshire.....	2
Cirencester.....	Robert Elliott, public office, Cirencester.....	2
Cleveland.....	T. Petch, Marlon, Middlesbrough.....	1
Clwyd, Vale of.....	J. D. Lewis, land agency office, Denbigh.....	1
Cornwall County.....	G. H. P. Martin, Truro.....	1
Cowbridge Farmers' Club.....	G. E. Tutton, Broadway, Cowbridge.....	1
Croydon Farmers' Club.....	G. Horsley, 85 Canterbury road, Croydon.....	1
Devon and Cornwall.....	J. B. Body, Old Town Chambers, Plymouth.....	1
South Durham and North Yorkshire.....	C. Waistell, Northallerton.....	1
Essex.....	E. H. Bentall, Elm Villa, Halstead.....	4
South Essex Farmers' Association.....	R. T. Wragg, Great St. Helen's.....	1
Gloucestershire.....	A. C. Wieseley, Gloucester.....	3
Hampshire.....	Robert Raynbird, Basingstoke.....	2
Herefordshire.....	J. P. Brown, 21 East street, Hereford.....	2
Hertfordshire.....	Vernon Austin, Hertford.....	2

Central Chamber of Agriculture—Continued.

Chamber.	Secretary.	Vote.
Howdenshire.....	Henry Green, solicitor, Howden.....	1
Ixworth Farmers' Club.....	J. G. Booty, Ixworth, Suffolk.....	1
Kendal.....	Arthur Hoggarth, Kendal.....	2
East Kent.....	George Slater, land agent, Canterbury.....	2
Leicestershire.....	Thomas Wilson, Knaptoft House, Oundle.....	3
Lincolnshire.....	Stephen Upton, Saint Benedict's square, Lincoln.....	1
Maidstone.....	G. Hurn, Maidstone.....	2
Monmouthshire.....	J. S. Stone, 29 Dock street, Newport.....	1
Newcastle Farmers' Club.....	T. Bell, Hedley Hall, Marley Hill, Gateshead.....	1
Newbury.....	George J. Cosburn, Market place, Newbury.....	1
Norfolk.....	J. B. Forrester, Tombland, Norwich.....	5
Northamptonshire.....	Thomas J. Adkins, Kurdey road, Northampton.....	3
Nottinghamshire.....	Ed. Browne, 1 Cobden Chambers, Belhanast, Nottingham.....	1
Penrith Farmers' Club.....	Thomas Robinson, Lamont Bridge, Penrith.....	1
Peterboro' Agricultural Society.....	J. E. Little, Queen street, Peterboro'.....	1
Scottish.....	David Curror, India Buildings, Edinburgh.....	1
Sevenoaks Farmers' Club.....	W. H. Cronk, Sevenoaks.....	4
Shropshire.....	Alfred Mansell, College Hill, Shrewsbury.....	2
Somersetshire.....	Messrs. Mayo and March, Yeovil.....	4
Staffordshire.....	W. Tomkinson, Newcastle, Staffordshire.....	4
Staindrop Farmers' Club.....	John Abbs, Westholme Winston, Darlington.....	1
East Suffolk.....	R. L. Enerett, Rushmere, Ipswich.....	2
West Suffolk.....	G. Blencowe, Whiting street, Bury St. Edmunds.....	3
Sunderland.....	J. T. Lawson, Hollyear House, Tunstall.....	1
Swindon.....	J. A. Davies, 6 High street, Swindon, Wilts.....	1
Warwickshire.....	Hugh Suffolk, 8 Priory row, Coventry.....	3
Wisbeach District.....	George J. Moore, 1 Bridge street, Wisbeach.....	1
South Wilts.....	J. R. White, Zeals St. Martin, Bath.....	2
Worcestershire.....	John Bick, solicitor, Droitwich.....	3
East Riding of Yorkshire.....	Tom Turner, solicitor, Newbegin, Beverley.....	1
West Riding of Yorkshire:		
Wakefield Branch.....	M. B. Hick, Exchange buildings, Wakefield.....	2
Doncaster Branch.....	George Chafer, 9 Market place, Doncaster.....	2
York.....	H. F. Cundall, 2 Blake street, York.....	2

DAILY INCREASE IN WEIGHT OF VARIOUS BREEDS.

[Inclosure 17 in Consul-General Merritt's report.]

The following table shows the comparative daily rate of increase in the classes for steers in the Devon, Hereford, Shorthorn, Sussex, Red Polled, Scotch Polled, and Crossed breeds of cattle at Islington.

	Pounds.
Classes for steers not exceeding 2 years old:	
Crosses—7 animals average.....	2.20
Herefords—6 animals average.....	2.24
Sussex—7 animals average.....	2.14
Shorthorns—8 animals average.....	2.06
Devon—7 animals average.....	1.70
Classes for steers not exceeding 3 years old:	
Shorthorns—16 animals average.....	1.93
Crosses—10 animals average.....	1.90
Herefords—8 animals average.....	1.88
Sussex—7 animals average.....	1.84
Scotch Polled—10 animals average.....	1.81
Red Polled—3 animals average.....	1.60
Devons—8 animals average.....	1.52
Classes for steers not exceeding 4 years old:	
Shorthorns—3 animals average.....	1.61
Herefords—2 animals average.....	1.60
Sussex—2 animals average.....	1.60
Crosses—3 animals average.....	1.60
Scotch Polled—5 animals average.....	1.55
Red Polled—2 animals average.....	1.40
Devons—7 animals average.....	1.35

FRENCH LIVE STOCK.*

[From the London Farmers' Hand-Book. Inclosure O in Consul-General Merritt's report. Expressly translated for the Royal Agricultural Society's Guide, from the official French catalogue of Paris Exhibition.]

The races of domesticated animals met with in France are numerous and widely different, and constitute one of the principal sources of the agricultural wealth of that country. Subject to the various conditions of climate, soil, system of cultivation, &c., they are distributed as follows, according to the last general census of 1873:

Calves	1,252,477
Young bullocks and bulls	947,821
Heifers	1,476,589
Bulls	313,081
Oxen	1,792,570
Cows	5,938,450
Total	11,721,818

The Departments in which the number of stock exceeds 200,000 head are—Finistère, Vendée, Loire-Inferieure, Ile-et-Vilaine, Saone-et-Loire, Cotes-du-Nord, Morbihan, Maine-et-Loire, Mayenne, Nord, Calvados, la Manche, Ain, Puy-de-Dome, Seine-Inferieure, and Cantal.

Those in which the stock is less than 20,000 head are—Vaucluse, Var, Seine, Gard, Herault, Basses-Alpes, Bouches-du-Rhone, Alpes-Maritimes, and the jurisdiction of Belfort.

THE NORMANDY BREEDS.

The Department of Manche, the actual cradle of the Normandy races, constitutes, with that of Calvados, the principal center of production of the stock belonging to the Normandy breeds and their sub-breeds, which latter form a somewhat important item in the supplies furnished for the consumption of Paris.

The Norman breeds are also kept, though in smaller numbers than in Manche and Calvados, in the Department of the Orne, Eure, Seine-Inferieure, Eure-et-Loir, Seine-et-Oise, Seine-et-Marne, and Seine, whence their heifers are sent up, in competition with Flemish cows, to restock the cow-sheds of Paris and its environs.

The famous Isigny butter is made from the milk of cows of the Bessine breed, and from that of other Normandy breeds is made Gournay butter, and the choice Camembert, Livarot, Pont l'Eveque, and Neufchatel cheeses, as well as the Neufchatel double cream cheese, and the Gournay variety known as Gervais cheese.

THE FLEMISH BREED.

The Flemish breed are pre-eminent as milkers. They are met with in the departments of Nord, Pas-de-Calais, Aisne, and up to the suburbs of Paris, but the principal breeding center is in the arrondissements of Dunquerque and Hazebrouck, especially on the extensive pasture of Bergues, Cassel, and Baillieu, where a judicious selection maintains the breed in all the plenitude of its best characteristics.

The Flemish cow is distinguished by a reddish-brown coat, deepening in color towards the head, with a few white marks. The extremities and the natural openings are black. It is of large size and handsome conformation, with a fine skin, a good head, a very straight dorsal line, a large rump, and a fine, well-hung tail. At the same time the chest is wanting in width, and the sides might well be more rounded.

A good Flemish Bergues cow will produce as much as 2,600 liters of milk a year. The daily yield, after calving, often rises in fact to 25 liters, or in exceptional cases even to 30 liters.

The males of this breed are slaughtered when quite young and sold as veal, with the exception of the few reared for breeding purposes.

THE CHAROLAISE BREED.

The Charolaïse breed is the handsomest and the most important in the central departments. Originally coming from Brionnais and Charolaïse (the southwest part of the department of Saone-et-Loire), it is now bred throughout the whole Saone-et-Loire, Nièvre, and Allier, as well as in certain parts of Cher, Yonne, Cote d'Or, and Haute-Saone. They are good working oxen, and furnish first-rate butchers' meat.

The portraits of French cattle which accompanied this inclosure are inserted at page 725.

The Charolaise is recognized by its white coat of fine silky hair, its regular cylindrical body, short broad head, furnished with fine and thick white horns curved up toward the points, its rose-colored muzzle, large eye, and gentle physiognomy. It is short in the leg, and exhibits a well-hung tail, a very prominent and deep rump, a broad straight back, well rounded sides, a full deep chest, and a neck and shoulders carrying little dewlap.

The cow is by no means a good milker.

The sub-breed, "Charolaise-Nivernaise," the best types of which come from Nievre and Allier, is particularly worthy of notice, and superior to other French breeds from the butchers' point of view, having indeed sometimes carried off the prize in open competition with Durhams and Durham crosses.

Animals of the Charolaise breed are bought at very high prices by the farmers of the north and of the suburbs of Paris, who use them first for field labor and then fatten them for the butcher.

THE GASCONNE AND CHAROLAISE BREEDS.

The Charolaise has its center of production in the district of Carole (Ariege), the second in the department of Gers, more especially in the arrondissement of Lombes. Both are descended from the Schwitz breed; they are essentially working oxen, and are often kept as such till fifteen years old or more.

The conformation of animals of these breeds is tolerably regular, the body cylindrical, the chest well developed, the limbs strong, the bony framework a little coarse, and the tail attached a trifle high. The coat is badger-gray of more or less pronounced shades, the extremities and the natural outlets generally black.

The cows are tolerable milkers.

These two breeds give rise to a brisk trade between the districts where they are reared and the departments of Haute-Garonne, Tarn-et-Garonne, Lot-et-Garonne, Aude, Hautes-Pyrenees, and Tarn, where they are much sought after for draught purposes.

THE GARONNAISE BREED.

This breed, the bulkiest of those found in the sub-Pyrenean basin, belongs to the great Gallie bovine family, and is divided into two groups—that of the valley, which furnishes the better developed animals, and that of the hills, whose members are smaller and less heavy, but more capable of work.

Garonnaise oxen are very long in the body, and often betray a faulty conformation; the sides are flat, the chest confined, the buttock short, the tail badly set on, and the osseous frame mean. Its long, heavy, busked head gives the animal a melancholy appearance. The coat is of a uniform wheaten color, the muzzle and the border of the eyelids pale red, and the horns white.

The cows are better shaped than the males, but are poor milkers. The Garonnaise breed is much esteemed for laboring purposes, on account of its colossal strength and its patience; it also fattens pretty easily.

The best centers of production are the valley of the Gargonne as far as Agen, and the Dordogne valley.

THE BAZADAISE BREED.

The arrondissement of Bazas is the chief rearing ground of animals of this breed, which is nevertheless found in the departments of Landes and Gers, and in certain parts of Lot-et-Garonne and of Tarn-et-Garonne.

The shape of these animals is perfect. The chest, well let down, is broad and deep; the flank rounded, and the body generally almost cylindrical; the line of the back straight; the haunch broad, square, and well placed; the rump often very good, occasionally leaves something to desire in a good many specimens. The head is short, the forehead broad and open; the horns are often faulty.

The females may be said to be irreproachable as to shape, but they are poor milkers.

The bull is a wild, almost ferocious, animal, and extremely dangerous. From a very early age it is hardly safe to go near him, and even in the stall he has to be tied up with strong ropes. The oxen are capital workers, but always preserve their character for violence and spirit; they are extremely irritable, and much management and all sorts of precautions are necessary in leading them.

THE FEMININE BREED.

This breed, which belongs to the Comtois type, is chiefly raised on the borders of Doubs and Saone, and is met with as far as Bresse.

The hair is of a more or less deep wheaten colour, the head slender, the horns small and placed near the eyes, the neck slim, the chest narrow, the body long, the hindquarters broad, the legs short and thin, the skin supple and very delicate, the root of the tail a little prominent.

The cows run small and are generally good milkers, the ordinary yield of milk, after calving, being from 15 to 18 liters a day.

The bulls are very spirited, and become vicious as they grow old. The oxen are strong, active, tractable, and form excellent draught beasts.

This breed fattens late, but easily.

THE PYRENEAN BREEDS.

I.—*The Lourdes Breed.*

These are good milkers compared with the other breeds of the Pyrenean basin; they are chiefly used in the valley of Argeles (Hautes-Pyrenees).

They are of small stature, and carry a coat of light wheat color, which is considered characteristic of purity of blood. In the bulls this color is somewhat deeper. The head is long and somewhat heavy; the horns of a dull white.

This breed, highly esteemed as good milkers in a district where these are rare, supplies the cow-sheds and dairies of Tarbes, Bagneres, and the large towns of the southwest.

II.—*The Aure-Valley and Saint-Girons Breeds.*

These two breeds have many points in common. The first is raised in the high-lying valleys of the Pyrenees; the second is restricted to the arrondissement of Saint-Girons (Ariege). The latter, which may be regarded as the ancestor of the Bazadaise breed, is well made, though small, and of general graceful appearance. The coat is of a deep badger-gray color passing into chestnut, and all the exterior mucous membranes are rose colored. The animals are not so strong as those of the Lourdes breed.

The Saint-Girons cow, highly esteemed as a milker, is sent out to Ariege generally, to Haute-Garonne, Aude, and Herault; it is essentially the cow for small holdings, and may be regarded as the Bretonne of the southwest.

The Aure breed is not so small; its coat is rough and more tawny in color, and the cows are not such good milkers.

The bullocks of both breeds are small, squat, hardy, and without any specially prominent characteristics.

III.—*Bearnaise, Basquaise, and Urt Breeds.*

These three breeds belong to the same family, and such differences as there are between them are scarcely appreciable. Their essential characteristic is their aptitude for work combined with the production of meat of excellent quality.

All three are graceful in appearance, spirited, and playful. The head is short and square, the broad forehead bearing well-placed and finely curved-horns. The coat varies from deep red to light wheat color; and these differences of color, as well as certain gradations in the direction and length of the horns, constitutes almost the whole distinction there is between the three types.

The bull bears a very fully developed horn from an early age (a character which is rather rare in the generality of French breeds), and is very courageous.

The cows are bad milkers, and are chiefly used for draught purposes.

The bullocks are active, and good workers; but they require gentle management, being easily made restive and obstinate.

The raising of these three breeds is carried on in the part of the Pyrenees situated between Saint-Jean-de-Luz and Canterets. They are generally sent to be fattened in the department of Landes, and notably in the arrondissement of Saint-Sauveur, whence they acquire the name of "bœufs landais," by which they are known on the Bordeaux market.

THE LIMONSINE BREED.

This breed is principally raised in Haute-Vienne. It is of medium size, and the coat is of red wheat color.

The head is light, the muzzle and eyelids pale rose color, the horns white and open, the back well set, the side rounded, the attachment of the tail a little prominent, the limbs short and fleshy, the extremities white. Their leading characteristics are docility, aptitude for work, and early fattening.

The cows are moderate milkers. The Limonsine breed ranks among the best of France in respect to yield and quality of meat.

THE SALERS BREED.

This breed originally hailed from the mountains of Auvergne—the central plateau of which it frequented—and from Cantal and Puy-de-Dôme, extending westward towards the neighboring departments.

The Salers present a slender appearance, with bulky and powerful bones; the coat is a bright red mahogany, marked with white under the belly. The head is short and strong, the forehead broad and covered with abundant curly hair; the horns smooth, twisted, and turned outwards; the body long, cylindrical, mounted on long legs; the head and shoulders strong, the dewlap thick and prominent, the rump short, with the tail attached high up, the bony prominences well marked.

In the plains of Limagne these animals have a pied red coat; the body is shorter, squarer, and lower on the ground. In the east district the coat is brilliantly dappled—pied chestnut or black—and the head white.

The Salers cattle are reproduced with great fixity of type: they are hardy, good workers, and tolerably fair milkers.

THE AUBRAC BREED.

This breed, originally from the mountains of Aubrac, is mostly raised in Aveyron, Lozère, and a small part of Cantal.

Its characteristics are—coat varying from fawn gray to silvery gray, horns large and black pointed, head handsome, eye brilliant and level with the head, neck and shoulders short and muscular, dewlap loose, chest well developed, trunk compact and symmetrical, legs broad and short.

The Aubrac is quiet, gentle, tractable, strong, and well fitted for working, fattening, or milking. Its meat is of excellent quality.

The oxen leave the mountains for Lozère when about three years old, and after three or four years' work are fed up on the Mezenic pastures, and thence consigned to the meat markets of the large towns of the southeast.

THE MEZENC BREED.

The district of Mount Mezenc (Ardeche) may be regarded as the cradle of the race, which is distributed in the departments of Ardeche and Haute-Loire, and a part of that of Loire.

Its distinguishing points are—coat light red or wheat colored, head massive, horns large and projecting in front, skin thick, hair coarse, dewlap hanging under the throat, chest tolerably large, flank long and hollow, loins weak, bones enormous. It is saddle-backed.

Beasts of this breed possess strong constitutions, and are good paying animals, owing to their aptitude for work as well as for the production of meat and milk. The Mezenc ox is much esteemed as food from the rich flavor of its meat, due to the Alpine flora on the Mezenc pastures, and from his early maturity.

THE PARTHENAISE BREED AND ITS OFFSHOOTS.

The Parthenaise breed and its derivatives (Vendeenne, Nantaise, and Mancelle breeds) constitute the horned stock of the department of Deux-Sevres, Vendee, and Loire Inferieure, and a great portion of those of Maine-et-Loire, Vienne, Indre-et-Loire, and Charente-Inferieure.

This family, which the breeders consider as a pure race, is regarded by zoologists as the produce of a cross with animals of different Swiss breeds. Thus in the Mancelle cattle we recognize the characters of the great Bernoise and Fribourgeoise breeds, and in the Parthenaise and Nantaise beasts those of the Schwitz breed.

The whole of the Parthenaise group proper has the fixed characteristic of black external mucous membranes, surrounded by a badger-gray circle. In the others this mark varies with the tint of the hair surrounding them. At the same time the mixture of foreign blood has not been introduced to such an extent as to modify the shape of the animals, which remains entirely that of a French breed.

The Parthenaise cattle combine the three faculties so desirable to be united in a breed: working power, facility of fattening, and good milking qualities.

Animals belonging to this family are distinguishable by their light bony frame, their graceful, well-proportioned body, small head with broad flat forehead, and handsome well-directed horns, which are always brilliantly black. The eye is well placed, animated in expression, and the general aspect docile.

The oxen are capital workers, and when fattened their meat is considered second to none on the Paris market, where it is known as Chollet beef.

The cows are good milkers, and are used exclusively for milk production, never being put to draught work. On the rich pastures of Loire, along the coast from Loire to Charente, cows of this breed are often met with, which can hold their own as milkers with the finest animals known.

THE TARENDAISE OR TARINE BREED.

The small-sized breed, originally from the mountains of Tarentaise, is quiet, hardy, patient, and distinguished for its working power, and above all for its quality as a milker.

The coat is light gray, the extremities and the natural apertures black. In the bull the coat is more frequently badger gray, black on the neck, checks, and lower parts; in the cow it is tawny, or of a gray wheat color, observable in no other breed.

The trunk is compact, the leg short, the sides rounded, the head short, the forehead broad, the horns well set on, the eyes large and mild.

These animals are eminently fitted to replace sheep on the Alpine pastures, and yet maintain their fitness for the Mediterranean littoral, despite the heat of the climate.

THE BRETONNE BREED.

The Bretonne breed, which would appear to have originally come from the department of Morbihan, is met with in the five departments forming the ancient province of Brittany, with the exception of a portion of Loire-Inferieure, where the Parthenaise and Nantaise breeds are kept, and the confines of Ille-et-Vilaine, where Normandy stock is preferred.

Bretons are hardy, docile, and good workers.

The cow, which has been justly described as the milker *par excellence* of poor districts, is small and squat, the limbs are short and rather slim, and the extremities particularly slender; the head short, the eye vivacious, the muzzle black, occasionally mottled, and rarely white; the horns thin and white at the base, but occasionally dissimilar; the coat generally pied black, the skin fine, lissome, and readily detached, the gait quick and decided, and the disposition mild and sociable.

In the more fertile and better cultivated parts of Brittany animals of the Bretonne race are more developed and exhibit a better shape generally.

On the north coast, and in Finistere especially, pied chestnut animals are met with, having some resemblance to the Channel Islands breed, so specially remarkable as milkers. Most of these are the result of crosses with bulls other than those of Brittany, the object in view having been to increase the size of the Bretonne breed.

DURHAMS AND DURHAM CROSS-BREEDS.

The Durham breed was introduced into France in 1833 by the "Administration de l'Agriculture," ably seconded by MM. Aug. Yvart and Lefebvre de Sainte-Marie.

It was at first located at the Pin Stud Farm, but since 1861 the experimental breeding station has been transferred to Corbin, in Calvados. The foundation of this establishment has had a great influence on the progress of French agriculture, by showing stock-owners the advantages of early maturing breeds.

The distinctive qualities of Durhams are their extraordinary aptitude for putting on flesh, and their great precocity which allows of their being slaughtered at three years old, or a little more, and always at less than four years. The shape of the Durham ox, called in England the "Shorthorn improved," is perfect from the butcher's point of view.

Durhams are less difficult to rear than might be supposed, and they succeed perfectly well under favorable conditions. They have increased largely in the departments of Maine-et-Loire and Mayenne, where they are maintained pure, and are met with here and there in all parts of the country. Numerous breeding stations have been established, and are answering well, in Cote-d'Or, Finistere, Ille-et-Vilaine, Loire, Orne, Sarthe, Seine-Inferieure, and some other departments of Central France.

The French "Herd-book," eight volumes of which have now appeared, shows that more than 19,000 Durham bulls and cows have been used for breeding purposes in France since 1838, and that the bulls especially have contributed much towards the creation of a considerable number of desirable crosses.

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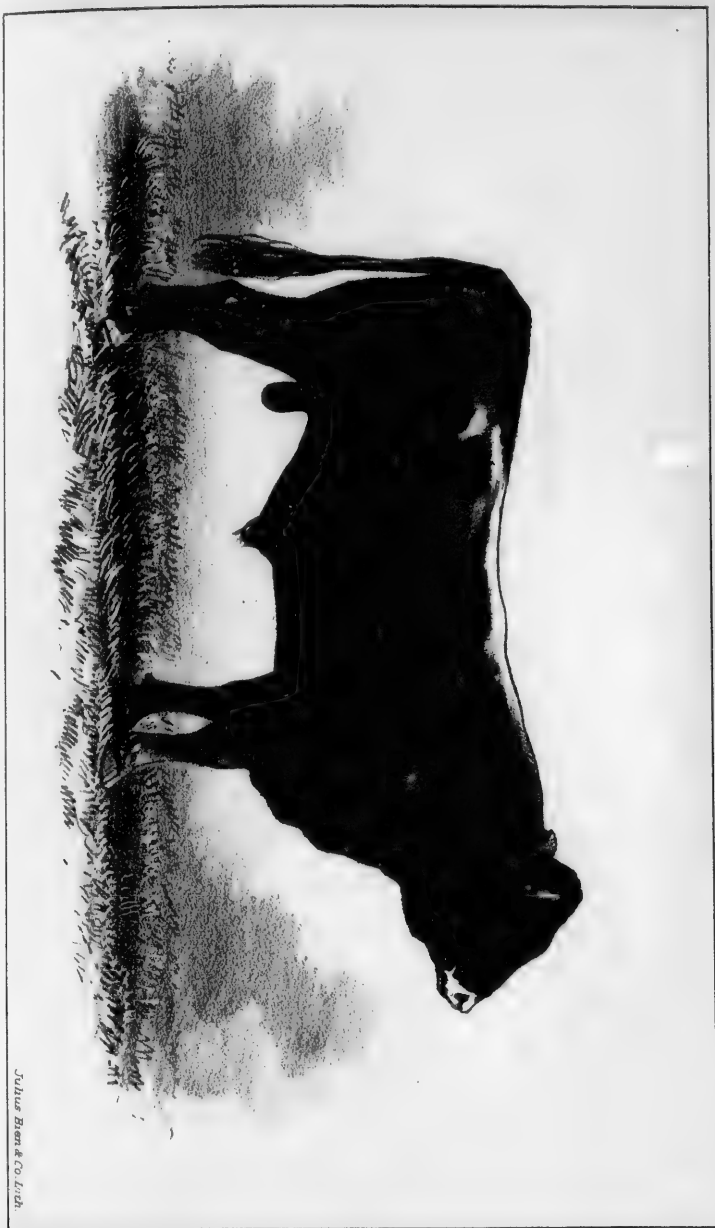
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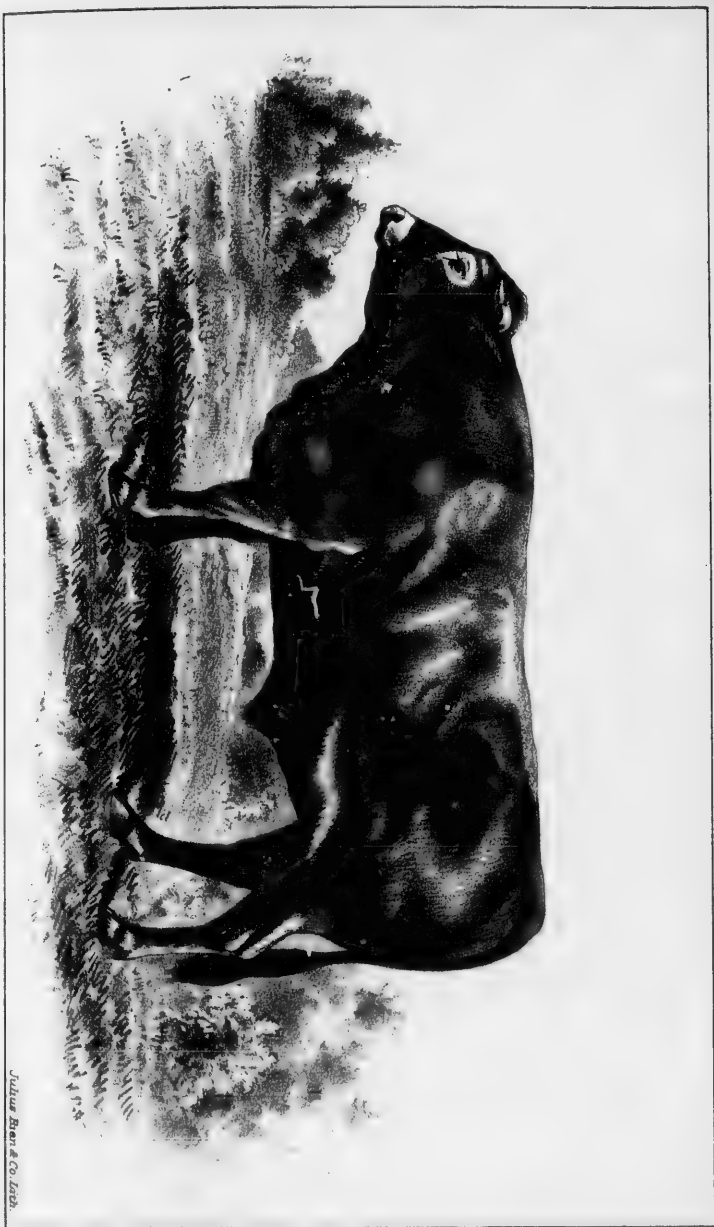


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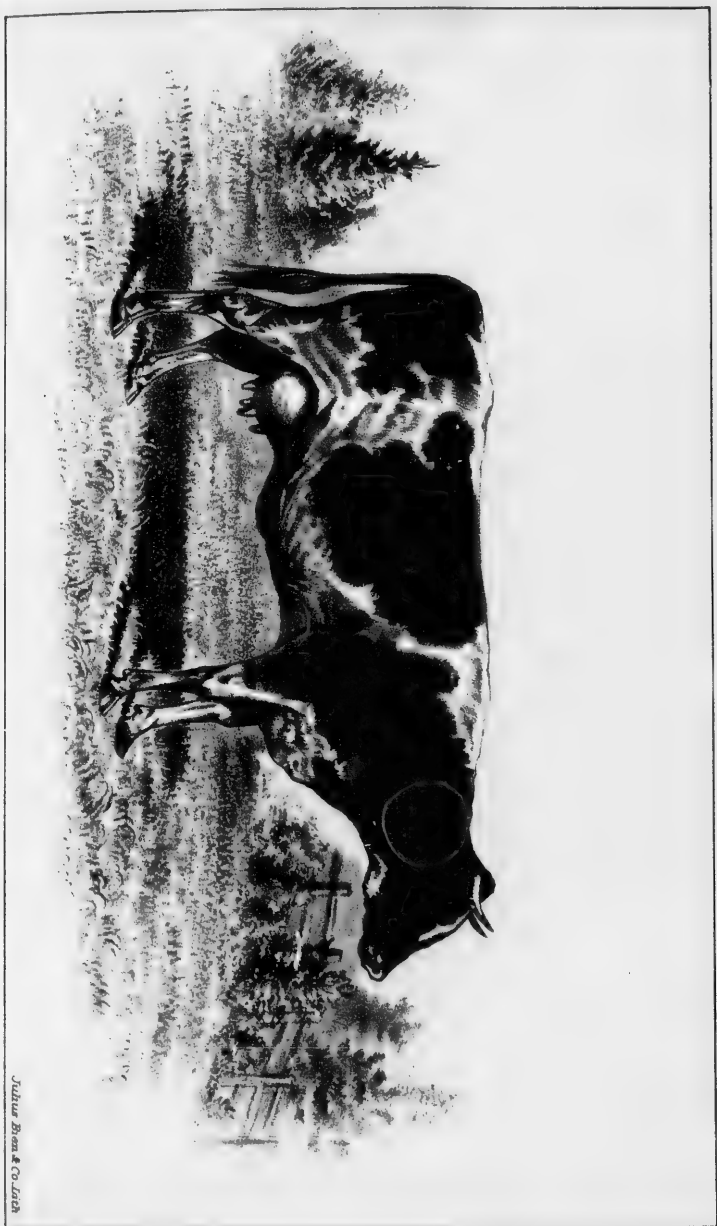
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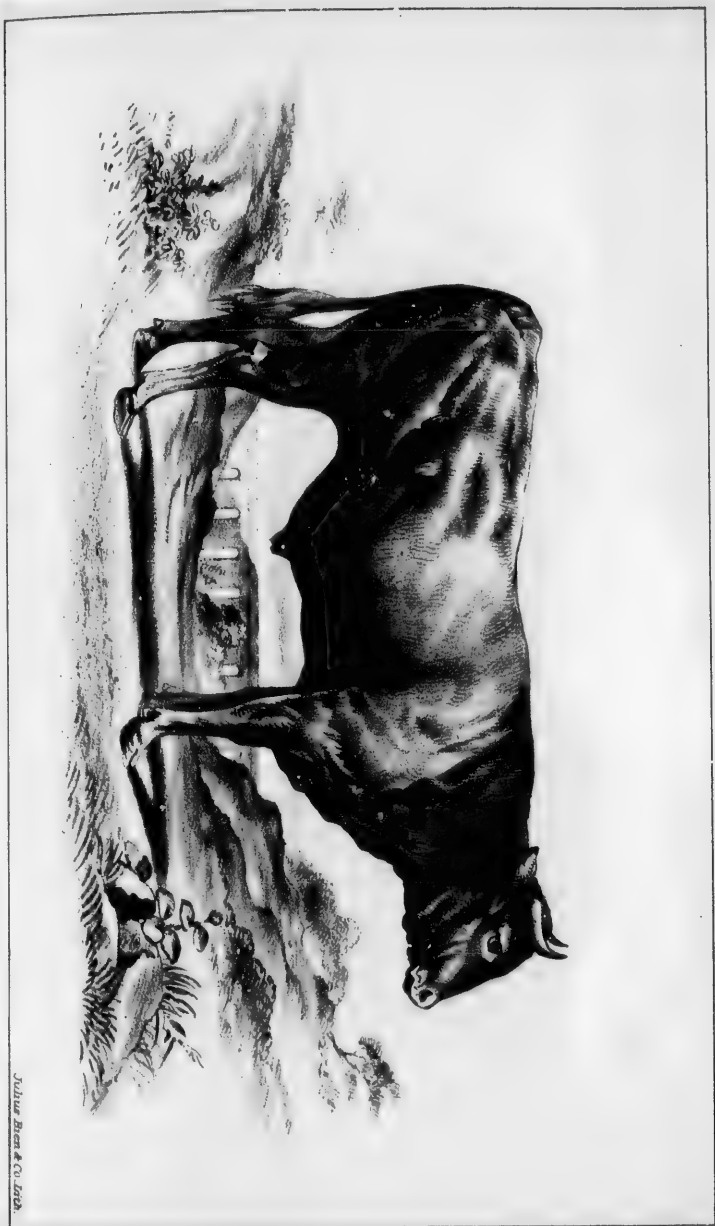




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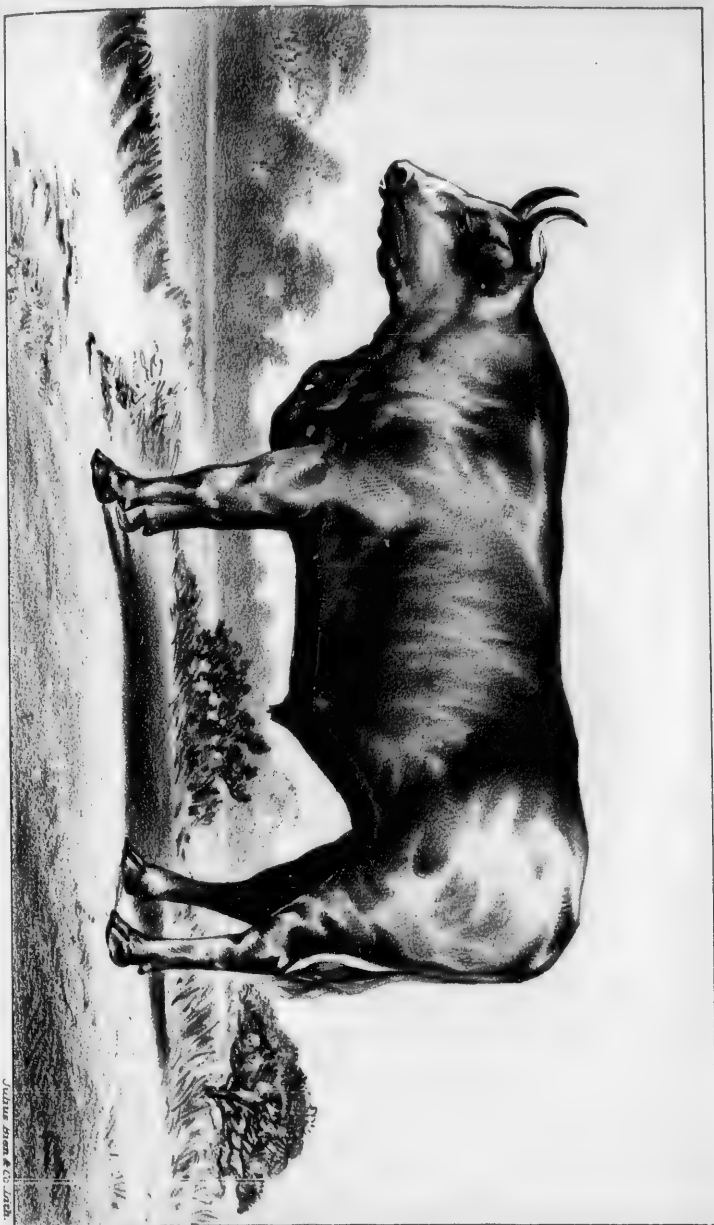






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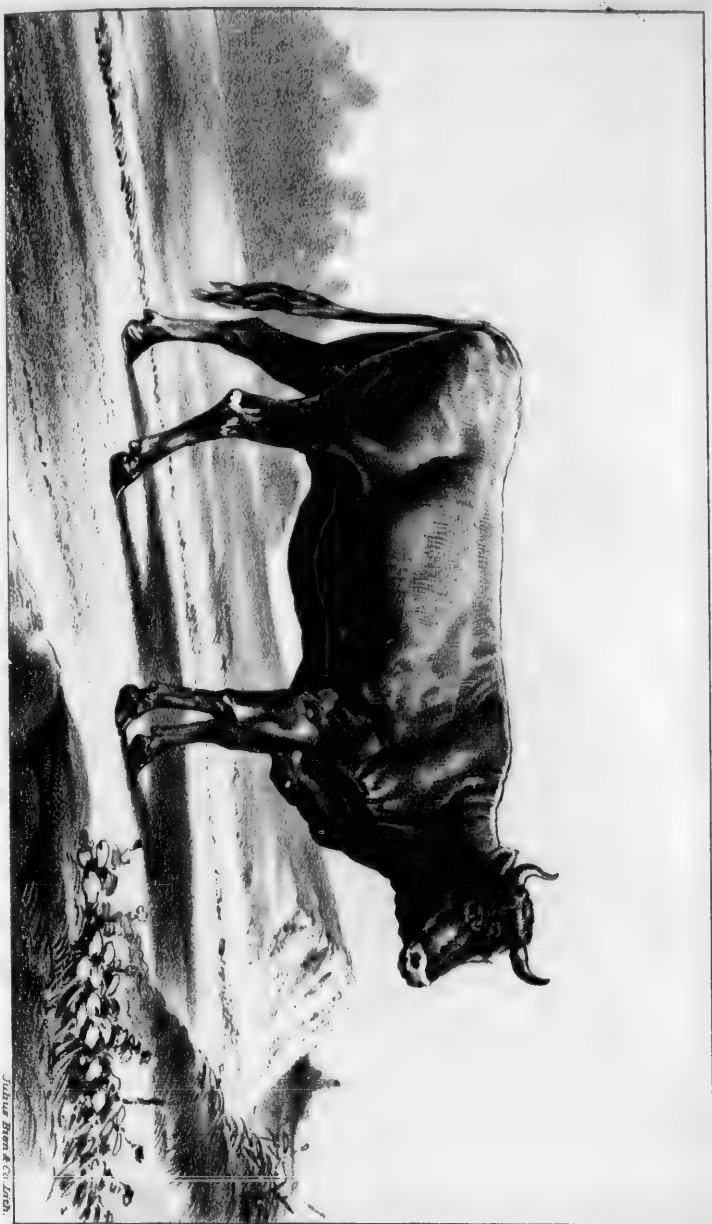


FRENCH OX

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FRENCH COW

Julius Stern & Co. Zurich



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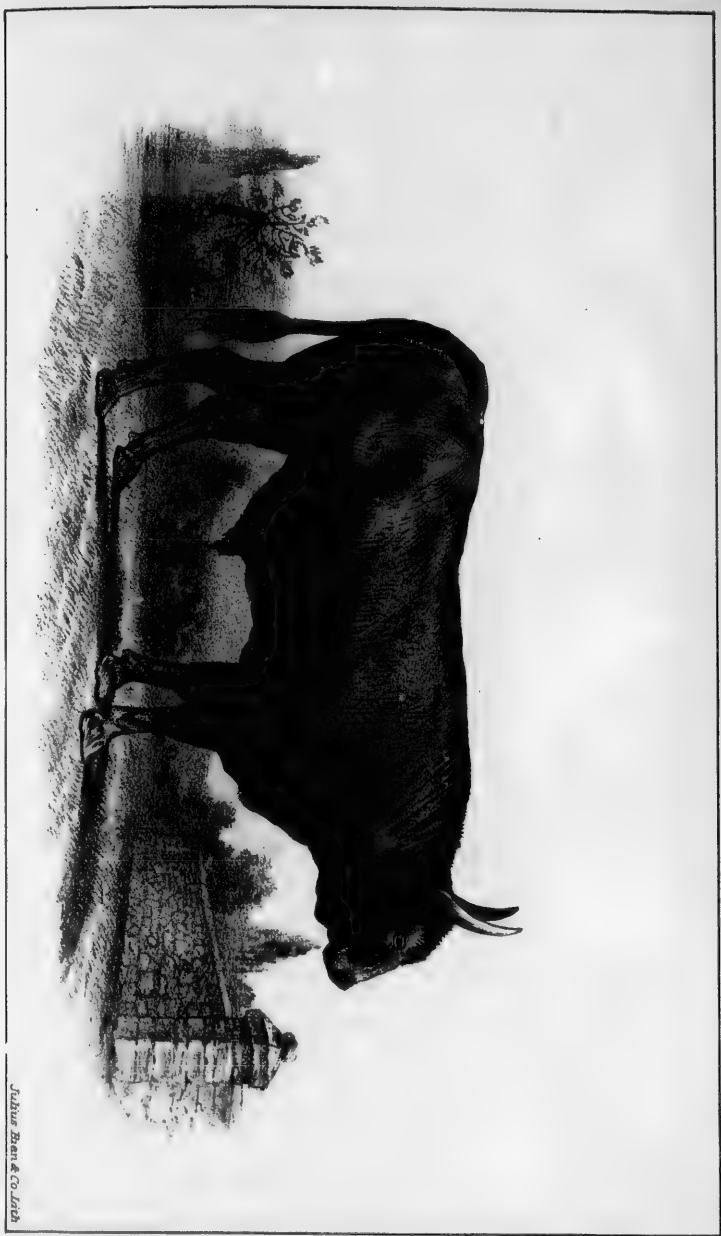
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Published by the American Museum of Natural History

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It is more particularly in the department of the West that Durham cross-breeds have been most numerous, and that their influence on the condition of agriculture is most appreciable. At the present time the superiority of English blood for getting good crosses for the butcher is beyond dispute.

FRENCH CATTLE.

[Reports contributed to The Field Newspaper, February, 1883, by H. Kains-Jackson. Inclosure O O in Consul-General Merritt's report.]

FAT STOCK IN FRANCE.

PARIS, February 1, 1883.

The Agricultural Implement and Fat Stock Show in Paris, under the auspices of the ministry of agriculture, and supported by the chief land-owners, stock-breeders, and machine-makers of the country, has just been concluded, and I send a list of a few of the chief prizes, reserving remarks for a letter next week. Of fat stock there were 345 bullocks and cows, 91 lots of sheep (the pens being sometimes of three or a score), 120 lots of pigs; whilst of poultry, rabbits, and pigeons the numbers were 2,400; and, as a special and new feature of this season, there were on show 68 young bulls, 63 rams, and 23 boars. Added to this goodly collection were 318 lots of dead poultry, and large collections of roots, vegetables, corn, grass, fruit, butter, cheese, oil, &c. The implement show consisted of 4,500 diverse machines and agricultural appliances and tools. The show of the latter was open on Tuesday week, but was scarcely visited until the cattle show judging commenced on last Saturday; and catalogues and prize lists were issued on the first "franc day" (Sunday). The exhibition closed on Wednesday, after proving a successful attraction to the Paris people and country inhabitants of the departments generally.

PRIZES.—First prize for bullocks born since January 1, 1880, H. Signoret, of Sermoise, Nièvre. First prize, bullocks born since January 1, 1879, M. Nadaud, of Chazelles, Charente. For breed prizes, Charolaise and Nivernaise, the first was taken by M. Bellard, of Saint-Aubin-les-Forges, Nièvre, with a white Nivernaise beast, weighing 19 cwt. 1 q. 6 lbs., No. 64, aged 45 months. The first prize for the Limousine breed was awarded to M. Parry, of Limoges, Haute Vienne, for a red animal weighing 19 cwt. and 16 lbs., aged 46 months; number of catalogue 83. For Garonnaise breed, No. 107, belonging to M. Bernede, of Meilhan, Lot, and Garonne, for a light dun, aged 4 years and 2 months, and weighing 1 ton and 28 lbs., took first prize. For the Baradaise breed, M. Chambaudet, of Meilhan, Lot, and Garonne, won first honors with No. 115, aged 40 months, and weighing 15 cwt. 3 qrs. 12 lbs. The grand race of Salers, the largest in France, was represented by the handsome red beast of M. Valtan, of Vindelles, Charente, aged 4 years and 1 month, but the weight of which was only 19 cwt. and 8 lbs. The first prize of the breeds Parthenaise, Chotelaie, and Nantaise was taken by No. 132, M. Poinet, of Léché, Vienne, for a gray Parthenaise animal, aged 5 years, and weighing exactly the same as the Salers beast, 19 cwt. and 8 lbs. Of the breeds Flanders, Normande, Mancelle, Femeline Bourbonnaise, Comptoise, &c., the first prize was awarded to M. Jaques Bellard, of Cours les-Barres, Cher, for No. 138, a Bourbonnaise, aged 4 years 2 months, weight not given. No. 148, owned by M. Rousseau, the elder, of Bordeaux, a dun Basquais, aged 4½ years, and weighing 19 cwt. and 32 lbs., took the first prize for the breeds Bearnaise, Basquaise, Aubrac, Mezenc, &c. The first prize for the Brittany breed was taken by M. Jean Brosier, of Saint Loup, Allier, for a black and white beast, aged 4 years 4 months and 10 days, weighing 11 cwt. and 10 lbs. The prizes of honor were given to M. Signoret for No. 26, a Durham-Charolaise; to M. Mativon, No. 234, also for a Durham-Charolaise; and to M. Gustave Valtan for his Durham-Manceau group of four beasts.

LIVE STOCK IN FRANCE.

The great show of cattle, sheep, and pigs, of poultry, agricultural produce, and implements, held last week in Paris, and which represented all France and some of its colonies, must include many points of interest to the readers of The Field. Under the auspices and control of a ministry of agriculture, and with such a magnificent and central site as is afforded by the Palace of Industry in the Champs Elysées, the exhibition formed a great display of rural economy. It is of the cattle that I have chiefly to speak, and, knowing France well in its country aspects, I may say that the various breeds brought together must have astonished and pleased any lover and critic of animal life. Contrasted with English breeds, the cattle were most conspicuous by their light and even color; the sheep by being shown out of their wool, and from the relative absence

of all heavy stock; whilst the pigs looked very much like their English brothers, and in fact were often more than half-and-half British blood.

It may be noted of "how they do these things in France," that each set of the judges is complemented by a member elected by the exhibitors in the respective sections. Certainly this is a commendable method, that might be introduced in English shows. In Paris more than a dozen gentlemen were thus assisting in awarding prizes.

The entries may be thus grouped:

Cattle	360
Sheep pens	92
Pigs	125
Bulls	68
Rams	63
Boars	23

Besides 2,269 pens of live poultry, pigeons, rabbits, &c.; 3,477 exhibits of roots, seed, fruit, vegetables, &c.; and 320 of dressed poultry, 487 of cheese, 217 of butter and milk, all of these being inside the building, whilst outside, occupying ample space on the walks and roads adjacent, the implement entries numbered 3,473, including a working butter-maker and Laval's cream separator.

The center of the large transept formed an admirable and roomy space for the exhibition of cattle, for the circulation of the public, and the task of the judges. There was abundance of litter, and in all respects the feeding and comfort of the animals left nothing to desire. The central and side passages were kept like garden walks, and shrubs and flowers in the center formed an ornament and a rendezvous where friends could meet. Under the galleries, corresponding to those of Islington, the great display of poultry, in wire-fronted boxes, flanked the live stock, whilst at either end of the vast building were the sheep and pig pens. Upstairs some thirty large rooms—the salons for pictures in May—were filled with cereal, seed, root, forage, and other agricultural produce, including oil and honey. As farm produce hops were missing, nor were there many exhibits of manures, phospho-guano only being well represented. The cheese, butter, and dead poultry exhibits were excellent and very numerous; and poultry appliances, including many incubators, made an exhibition of themselves. In one of these salons the English visitor might see with natural curiosity the inviting exhibit of sausages formed from the meat of beasts of burden—horses, mules, and donkeys—the latter being especially recommended at 10*d.* to 1*s.* 3*d.* per pound. Many persons tasted the tempting slices offered them, and judges rank asses' flesh as savory food. So good indeed is it, that "Pate de foie d'âne" formed a display after the fashion of our "Pimlico pies." Looking from the galleries, where knicknacks were sold, the scene of animal life below was cheerful and picturesque. The great blotches of color were more distinct than in an English show, as the breeds of cattle—white, cream white, dun—gave much the same impression as do a number of harvest fields of different grain, one tone being general. Of course there were red and roan and pied animals, but these were in a minority, and there were no classes of black cattle, Scotch polls, Welsh, and Irish to attract notice. This omission of black color from a fat-stock show was a notable feature.

As a curious piece of animal statistics may be given the following particulars of the prize animals killed and analyzed a year ago, only the chief being here given; and as French weights and figures serve for comparison as well as do English ones, the official report is quoted. It may be stated briefly, however, that a kilogram is equal to 2½ pounds, and 50 kilograms are close upon a hundred weight, and 1,000 kilograms a ton.

Breed.	Live weight.	Weight loss when killed after show.	Weight of four quarters.	First quality.	Second quality.	Third quality.	Suet.	Water in each 100 grams of lean meat.	Price made of animal.	Age in months and days.
	Kilos.	Kilos.	Kilos.					Grams.	Francs.	m. d.
Durham-Charolaise	926	46	608	223	149	140	80,000	69,625	2,025	32 17
Brazadais	914	39	594	207	120	120	77,000	59,325	2,000	54 00
Salers	906	41	590	231	154	139	76,300	.....	1,910	48 00
Parthenais	877	32	534	195	168	160	91,500	61,350	1,930	64 00
Basquais	897	42	594	239	171	118	73,500	58,500	*5,600	51 00

* Probably for exhibition.

Further, as regards loss of weight on being killed, the fat Norman only lost 8 kilograms, whilst Yorkshire lost 19 kilograms, and the big Yorkshire-Limousin but 7 kilograms.

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	Price made of animal.	Age in months and days.
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25	2,000	54 00
50	1,910	48 00
50	1,530	64 00
100	2,600	54 00

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I am hopeful of getting similar returns to the above of the cattle, sheep, and pigs at the present year's show, especially those referring to the two beasts exhibited by the Vicomte de Chezelles; which were fed on ensilage.

To give any adequate idea of the Paris Exhibition, it is necessary to run through the several classes, of which the first prizes were published in last week's Field, which represented the live stock of France, from its great plains, river valleys, and mountain-sides and table lands.

In Class I of young bullocks, born since January 1, 1880, were twenty-six entries competing for eight prizes, all of which were awarded, and a supplementary prize was added, whilst two animals were honorably mentioned. Many famous breeders competed in this class, of which nearly every entry had Shorthorn blood, the exceptions being a Nivernais, Basquais, Bazadais, Limousin, and Charolais-Nivernais animal, five in all out of twenty-six. Of the eight prizes, six were Shorthorn crosses, the sixth prize falling to a white Nivernais, and the eighth prize to a Charolais. The first prize was to a Durham-Charolais, the second to a red and white pure Shorthorn. The weights of all were good, but I should not consider any beast satisfactorily ripened.

Class I, section 2, was for bullocks born since January 1, 1879, and the extra year brought together thirty-six animals. Four to six years of age would appear most in favor in France at present for exhibition, as two to four years are in England. On this point, one should remember that the greatest proportion of oxen have two or more years at the yoke as draught animals.

Again, in this fine class Shorthorn crosses formed two-thirds of the total; but the heaviest beast was a white Charolais, which weighed 1 ton and 44 lbs. at forty-seven months old. The first prize of the class was a Durham-Charolais, red and white, weighing 19 cwt. and 14 lbs., age forty-two months. It was M. Nadaud's prime exhibit, and fought for the championship of the show against the Durham-Charolais of M. Signoret, which, a year younger, weighed within 60 lbs. of the older animal, and was judged by points a neck ahead, and so carried off the prize of honor. Generally, the animals in Class I would have been a fine display in any country.

Class II had the interest of being one of breed, and without distinction of age. There were nineteen entries, all of the Charolaise and Nivernaise breeds. The ages ranged from three years nine months to seven years, the majority being four or five years old. In this class a white Nivernais turned the scale at 22 cwt. 3 qrs. 9 lbs., the age being four years six months and twenty days. It gained a supplementary prize. These breeds are the chief working oxen of France, and until lately were not fattened until eight or nine years of age. The meat of these animals after four years is mature, savory, and highly nutritive. The first prize was taken by a white Nivernais, the youngest but one in the class.

Of these famous French breeds, the leading points are: They are handsome, good working oxen, and make first-rate butchers' meat; the coat is usually creamy white, with abundant hair; they have white middle-sized horns, turned up towards the points; the head is short and broad, the muzzle rose-colored, the eye is large, and the aspect gentle; a regular cylindrical body is set on short strong legs, the neck carries but little dewlap, the back is straight, ending in a well-hung tail, and the rump is prominent and deep. The race came originally from Saône-et-Loire, and is now the chief breed of the central departments. The cross with Nivernaise—an offshoot of the Charolaise—forms the best French beast for butchers. The cows are but poor milkers.

Class II, section 2, comprised twenty entries of Limousine cattle, aged from three years ten months to six years, most of them being four and a half years old. The color was always yellow, from a fawn white to a red wheaten-dun. The weights were generally close to M. Parry's first-prize beast weighing 19 cwt. 16 lbs. at three years ten months. The whole class was a good one, and carried one supplementary prize and one honorable mention. Docility, aptitude for work, and facility for fattening, make this breed a favorite. The Department of Haute-Vienne is its chief home, and at this show the best animal came from Limoges. The other prize animals were from the Gironde and Charente departments. For yield and quality of meat the Limousine ranks high; the features of a good animal being a light head, with white open horns, pink eyelids and muzzle, well-set back, rounded sides, short fleshy limbs, with white points that give a look of breed and fashion. A Limousine is usually less bulky than a Charolaise. The cows are fair milkers.

Class II, section 3, included the Garonnaise breed, and thirteen animals represented it. The race is improving, and was reckoned in advance of the Limousine cattle, supplying one of the heaviest beasts in the show, No. 113 weighing 22 cwt. 3 qrs. 6 lbs., and gaining third prize. Gironde and Lot-et-Garonne furnished the best specimens. The first prize weighed 1 ton 28 lbs. Garonnaise cattle are said to be the bulkiest in the sub-Pyrenean basin, and form two groups of the great bovine Gallic family—that of the valley and that of the hills. The latter are smaller, but more capable of work, than those of the valley. They have a very long body, flat sides, and confined chest, short buttock

and bony frame, with tail badly set. The head is long and heavy, with white horns and pale red eyelids. The coat is of an even dun or wheaten-yellow color. The oxen have colossal strength and work patiently, fattening easily. The females are handsomer than the bulls, but poor as milch cows.

Class II, section 4, had eight entries, all being of an even and rich grey color. Their weights were 905, 894, 933, 936, 881, 937 kilogrammes, or about 17 cwt. 3 qrs. each. The ages were from three years four months to five years. The first prize went to M. Cham-baudet, of Melhan, Lot-et-Garonne. Most of the exhibits came from the Gironde. The shape of the prize beast was typical of the breed which is reckoned perfect, with deep chest well let down, rounded flank, the body almost a complete cylinder, the line of back straight, the haunch broad, square, and well placed, heavy rump, sometimes bossy, horns often faulty, on a short head, with broad open forehead. For shape, the cows are especially handsome, but are only poor milkers. Temper in the bulls makes them generally dangerous. We have no breeds in England to parallel the Bazadaise. A group reminds one of a silver-grey Jersey herd, grown big and wild.

Class II, section 5, had but five entries; yet these were specimens of perhaps the most special breed in France, the bullocks often standing 6 inches taller than our biggest Short-horns. In color they are deep mahogany red, with white often under the belly. M. Gustav Valtau, who took many prizes, carried the first in this class with a four years ten months animal, weighing 20 cwt. 2 qrs. 10 lbs. This breed is improving; they are good workers as well as meat-producers. The mountains of Auvergne were the cradle of the race, of which the head is short and strong, the forehead broad and covered with curly hair, the horns smooth, twisted, and turned outwards. The body is long and cylindrical, mounted on tall legs, the head and shoulders are strong, the dewlap thick and prominent, the rump short, with tail attached high up. On the Limagne plains the body is shorter, squarer, and lower on the ground, the coat often chestnut and white, the head sometimes white; yet the Salers breed is one of the most fixed character in France.

Class II, section 6, was comprised of seven entries, for the breeds Parthenaise, Chole-taise, and Nantaise; but the specimens shown were all of the Parthenaise group. These were scarcely equal to expectation, yet their weights were fairly good; the first-prize animal, five years old, weighed 19 cwt. 8 lbs., and the second prize turned a ton. The Parthenaise family includes Vendéenne, Nantaise, and Mancelle breeds, which occupy several departments—the Deux-Sèvres, Loire-Inférieure, Charente-Inférieure, &c. The breed is regarded as pure by some, and as a mixed race by others—crosses between Bernoise, Fribourgeoise, and Swiss cattle. The animals have one fixed characteristic, that of black external mucous membranes, surrounded by a badger-grey circle. The shape of all the groups is that of the old French breed, which is remarkable for good milking qualities, good fattening qualities, and good working powers. Handsome, well-directed, brilliantly black horns, a graceful, well-proportioned body, and good disposition, belong to a true Parthenaise, one of the best milch cows in France.

Class II, section 7, included several breeds, as follows: Flamande, Normande, Mancelle, Femeline, Bourbonnaise, Comptoise, Bearnaise, Basquaise, Aubrac, Mezenc, Brétanne, Tarine, &c. Only ten entries represented the above races, and the first prizes awarded were to a four years and two months old Bourbonnais, a yellow dun, of which the weight was not given. In this class was the exhibit of the Viscount Arthur de Chezelles, which had been fed on ensilage, and was the heaviest beast of the class, weighing 21 cwt. 3 qrs. 6 lbs., age five years two months and ten days. A Bourbonnaise took second prize and third prize, whilst the Norman entries only got honorably mentioned. In the subclass a handsome mottled-dun Basquais took first honors. The four entries of Bretonne class were good, and of the type well-known in England.

Of the Flemish breed, the great merit is their milking qualities, and the chief breeding districts are in the Pas de Calais and Aisne departments. The cows are large, straight-backed, with a large rump and well-hung tail, color a reddish brown, deepening toward the head; some have a few white marks. The sides are wanting in roundness. Of course the cows are too valuable to send to a fat-stock show, and the males are killed early for veal, except such as are saved for breeding. Manche and Calvados are the cradle of the fine Norman breed, which is subdivided into Cotentine, Bressine, and Augeronne families. The breed is large and handsome, of great diversity of color and shape, but usually dappled, and often of the brindled-brown seen in our Longhorns. The quality of the meat makes the oxen valued in Paris, and specimens of this breed have been, it is stated, fattened to over 30 cwt. The cows are remarkable for their abundant and rich milk. The famous Isigny butter comes from the Bressine breed, and that of Gournay from various Norman families. The Livarot cheese, that obtained the prize of honor this year, is, like Camembert, Neufchâtel, &c., made from the milk of Normans.

The Femeline cattle, of which there were no entries at the show, are of the Comptois type, and are raised in the Doubs and Saône departments. The coats are wheaten-yellow, the head slender, with small horns close to the eyes, the neck slim, the chest

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long, the hind quarters broad, the legs short and fine, the skin supple and delicate, the root of the tail prominent. The cows are good milkers, the bulls vicious when old, the oxen good workers, and fatten easily. The first prize Bourbonnais came from M. Bellard, of Cours-les-Barres, Cher, and most of the entries were closely of the Charolaise type, but of a red-dun color. The breed is a favorite one with the butchers, and is well distributed in several departments across central France.

The Béarnaise, Basquaise, and Urt breeds are of the same family, and have the character of being good workers and producing excellent meat. The coat varies from deep red to light yellow color, the varieties showing the breed and district. The bull has a specially-developed horn, and is an animal of noted courage. The breed is from the Pyrenees, near Saint Jean de Luz, but stock for fattening are sent to the Landes, and so are often called "Landais" cattle in the Bordeaux market, where they are highly esteemed.

The mountains of Aubrac, the mountains of Mezene, give names to their breeds, which, feeding on fine herbage, have finely-flavored meat. The Aubrac is of a silver-gray or fawn color, with large horns, black at the points. The whole animal is compact and handsome, and the breed is a good one for working, fattening, or milk. The Mezene has a specially-developed horn, and is an animal of noted courage. The breed is from the Pyrenees, near Saint Jean de Luz, but stock for fattening are sent to the Landes, and so are often called "Landais" cattle in the Bordeaux market, where they are highly esteemed.

There remain for reference the grand open and large class of cross-breeds, of the cow class, the groups of cattle, the small exhibition of young bulls, and the sheep and pig classes, which may be deferred until next week.

INVICTA.

P. S.—I have just heard the sale price of M. Signoret's champion prize was 4,000 francs (£160), bought for Magazines du Louvre. The follow-champion made but 2,000 francs. M. Chaminade's champion pig sold for 1,000 francs.

"We are not accustomed to over-fatten meat in France," writes one of the leading French journals; and the same paper further declares that most of the animals sent to exhibitions pass the line that separates the best meat, as an article of food, from the too gross animals which carry off the prizes. Moreover, breeders, in preparing stock for exhibition, disregard economy in their production, which is better studied when ordinary butchers' animals are sent to market. "We are not Laplanders nor Esquimaux, to require such masses of fat as do the inhabitants of the Polar regions," indignantly exclaims the patriotic Frenchman, and next learnedly quotes the data of Messrs. Lawes and Gilbert, that ordinary beasts have only 19 per cent. of fat, whilst a fat prize ox has 30.1 of the same oily constituent—records of a very fat Shorthorn cow showing 6 inches to 10 inches of fat under the skin! However, as before observed, the fattest bullock in the Paris Show was a good way behind the champions of Norwich, Birmingham, and Smithfield, a finely ripened animal being a great rarity in the palace of industry. Last Tuesday week, certainly, the "Mardi Gras of Paris did not have any available fat ox to rival those of former days, even if carnival revels still had been in fashion.

To walk with the catalogue—and so continue my narrative of last week—the visitor to the Paris Show came to—

Class II, section 9, for pure foreign breeds, in which there were but four entries, all Shorthorns. And here—whilst in England there is a controversy about white cattle—the first prize may be recorded as falling to the forty months old white Shorthorn of M. Deplanche, the weight being 17 cwt. 3 qrs. 20 lbs. The second prize, for a white and roan, was taken by M. Nadaud, which weighed 44 lbs. more than the first-prize animal, although four months younger. The other two entries in this class were alike red and unsuccessful.

Class II, section 9, was the field of combat—an open class to all comers that were cross-breeds. The collection was a really fine one of forty-three entries, and to which no fewer than seven prizes and three honorable mentions were awarded. I put in a tabular form the list:

Prize.	Breed.	Color.	Owner.
First.....	Durham-Manceau.....	White and red.....	M. Arnaud.
Second.....	Durham-cross.....	White and red.....	M. Bouillé.
Third.....	Durham-Manceau.....	White gray.....	M. Deren-Legrand.
Fourth.....	Durham-Charolais.....	Dun.....	M. Mativon.
Fifth.....	Durham-cross.....	Yellow.....	M. Brignon.
Sixth.....	Durham-Manceau.....	White and red.....	M. Nadaud.
Seventh.....	Durham-cross.....	Brindled.....	Count Brieg.

* Heaviest beast in show, weighing 22 cwt. 1 qr. 23 lbs.

The three honorably-mentioned animals were Durham-Charolais, Durham-Manceau, and Durham-Charolais. The Prince de Wagram had a white Durham-Ayrshire, and there were competitors in Limousin-Charolais, Garonnais-Bazadais, Lorrain, and other varieties, all left behind, whilst the Shorthorn blood was in the van.

French politeness, that bids us give "place aux dames" in the salon, does not extend priority in the showyard to cows, which now patiently follow, and form into—

Class III, section 1, for animals born before May 1, 1879, and being pure or crossed French blood. This class was a good one of twenty-four entries, the ages running up 7½ years. It is enough to say the prizes fell to—first, a white Charolaise-Nivernaise; second, a light dun Limousine; third, a white Nivernaise-Charolaise; and fourth, to a white Charolaise. The red Flemish and Norman brindled-red animals failed to attract attention.

Section 2 was more cosmopolitan, and invited pure and cross-bred cows; and here again first, second, third, fourth, and fifth prizes had Shorthorn blood, two of which were pure white Shorthorns. An eight-year-old Swiss cow and a yellow Limousine-Swiss were competitors; but then the winning animals were exhibited by such experts as MM. Mativon, Tiersonnier, Nadaud, Langlade, and Larzat, the Strattons of France.

The good-group system that is in favor across the Channel now brought before us twenty-eight beasts, in lots of four each:

Class IV, bullocks born since January 1, 1879. It was in this class that M. Gustave Valtan took first prize and the championship with his four Durham-Manceau cattle, a remarkably even and well-finished lot, well-bUILT, square-set, and with capital hind quarters. The cross of the Durham-Norman group was passed over. The third prize and lot honorably mentioned were also of the Durham-Manceau breed, but the second prize fell to four white Nivernais, and all the groups were heavy, good beasts.

The second section of Class IV was for older animals, born before January 1, 1879. Here were fifteen groups, sixty animals; and besides the four prizes, the class was good enough to carry a supplementary prize. First, red and white, Durham-Manceau; second, white, Charolais; third, yellow, Basquais; fourth, yellow, Limousine; extra prize, white, Nivernais. I continue to give color, in evidence that white in France seems favored by climate.

The groups of cows in Class IV had sixteen animals and four prizes, but only two were given—Durham-Limousine first, and pure Shorthorns second.

Class V was fat calves, most of which were of Norman breed, as out of the twenty-three entries there were but the exceptions of a Swiss calf and three Cotentin (the latter a sub-race of Norman). The three prizes together aged but five months twenty days, with a total weight of 1,202 cwt. and 2 lbs.

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PORTRAITS OF CELEBRATED BRITISH PRIZE CATTLE.

[Inclosure 000 in report of Consul-General Merritt, of London; text and portraits being taken from English publications.]

A, Shorthorn cattle; B, Devon cattle; C, Suffolk cattle; D, Longhorn cattle; E, Hereford cattle; F, Sussex cattle; G, Ayrshire cattle; H, Jersey and Guernsey cattle; I, Welsh black cattle.

The portraits of each group immediately follow the text relating to the same.

A. SHORTHORN CATTLE.

Shorthorn Bull Duke of Underley.—We here present our readers with Mr. Williams's sketch of Lord Bective's Duke of Underley. The following descriptive paragraph relates rather to general family history than to this particular bull. The Duchess of Geneva Tenth came over to this country with the reputation of being one of the most beautiful Shorthorned cows in the United States. Nor did her merit end with herself. Her first calf in England was Duke of Underley, the subject of this portrait. He too satisfied the most fastidious breeders, whatever their preferences might be. He represents the Duchess family as America has made them, i. e. with a slight infusion of strange blood through Romeo, who entered, indirectly, into the pedigree of the sire of Duchess of Geneva Tenth. She was put to Duke of Tregunter Second, a Duchess bull, having the "Usurer" cross, which was added by Earle Ducie. Duke of Tregunter Second had proved himself, in Gloucestershire, to be a sire of remarkable merit; his daughters, especially, at Kingscote and Siddington, being very grand animals, with the best of middles and long hind quarters. It seemed but reasonable to expect that the coupling together Duchess of Geneva Tenth—an American success in breeding—with Duke of Tregunter Second, a well-proved English sire, would, to borrow a Yankeeism from Martin Chuzzlewit, "eventuate a spanker." The engraving is from a drawing in the preparation of which measurement and photography were both employed.

Shorthorn heifer Lady Violet.—These portraits (front and side views) represent Mrs. Pery's Shorthorn heifer, Lady Violet (calved December 19, 1876), to which was awarded the first prize in her class at the Royal Dublin Society's last spring show. Lady Violet is by Don Diego (33539)—dam Lady-love by The Earl (27623), g.-dam Lady Sarah by Best Hope (23413), &c. The side view is a good reproduction of a very successful photograph.

Shorthorn bull Anchor.—Lord Rathdonnell's bull Anchor (winner three years running at the Dublin Spring Show) was one of the sights at the Kilburn Show. It is good to have opportunities occasionally to compare the products of the sister kingdoms with our own. Clydesdale horses and Irish and Scotch Shorthorns are good tests by which to try English showyard favorites. Mr. Chaloner (the Irish judge), who bred Anchor, stepped on one side when the chief prize in this class was awarded. The other two judges gave the first place to Anchor, who, in addition to his personal successes, was shown in comparatively hard condition, an example worth copying. The engraving is, we think, a remarkably successful example of justice done by photography.

Shorthorn bull Telemachus.—Four or five groups of Shorthorns have, in the course of the last two seasons, made themselves conspicuous above their rivals for number and excellence. These are the Marquis of Exeter's Telemachus family, the Earl of Dunmore's Red Roses, Colonel Loyd-Lindsay's Burlesques, Mr. T. H. Miller's Ringlets, and Mr. W. H. Wodehouse's Countess groups. One and all of these are a sufficient answer to the oft-repeated assertion (which is, however, very limited truth) that fattened parents entail barrenness or degenerate offspring. It is one of the merits of the Shorthorn that it will bear forcing without breaking down. Among all the groups named the Burghley one must now be held to be entitled to the first place. Sea Gull and her offspring, all by Telemachus, are so curiously alike, and all of such a very striking type in the show ring, that she and they must be held to be the most remarkable family group in England. The members of the group seen at Kilburn were by no means all Sea Gull's produce by Telemachus.

Here we have a portrait of one of the winning four, all of whom are for color, size, and condition, entitled to rank separately as prizeworthy cattle.

Shorthorn cow Lady Carew Third.—In her old age Fanny, a Warlabby cow, went from Mr. Wilson, of Brawith, "for a song" to the Hon. Colonel Duncombe, who, bringing her to Waresley Park, had a heifer calf from her by Hero (a bull sharing Bates blood), which he called Heather Bell.

When Heather Bell was well-stricken in years she fell "to the nod" of the late Mr. Pawlett; who, hardly venturing to expect produce, put her to one of his Booth bulls—Prince James—and had a calf, so little expected that he named her Miracle. Miracle, in her turn, bred freely; and her blood-red daughter Lady Jane, by the "Bracelet" bull Baron Killerby, was one of the cheapest lots at the famous Beeston sale in 1872.

Mr. St. John Ackers took Lady Jane of Gloucestershire, and she has proved that the virtue of regular and long-continued fecundity is hers, as well as her granddam's; for she has produced in succession three light roan heifers, each of which in turn received the name of Lady Carew, by the white Warlaby-bred bull, County Member, of the Christon tribe. All the Ladies Carews have been successfully exhibited, and all have had the same characteristics. All have been somewhat small heifers; with very fine bone and on very short legs. All have had the silkiest of hair, and a long even carcase, somewhat unduly weighted with flesh and fat at both ends. Lady Carew third (of whom we give a portrait) has a bosom which is wonderful to see. She inherits the blood of almost all the leading strains, though her sire is purest Warlaby.

Shorthorn dairy cow Victoria.—The portrait represents Mr. Fred. Harvey's first prize cow in the dairy class at Kilburn, named Victoria—type of a capital dairy cow; well formed as the mother, whether of meat-carrying steers or milk-producing heifers. Here, too, we have an example of successful representation by means of photography.

Shorthorn dairy cow Maiden.—The profile portrait represents Mr. W. Stratton's white dairy cow, Maiden, which took the first prize in the class of unpigreed dairy cattle at the dairy show in the Agricultural Hall. She is, we understand, out of a good ordinary Shorthorn dairy cow, by the same sire as got Nectarine Bud, which was a noted prize-taker at both the Royal Agricultural Society's and the Birmingham shows.

Shorthorn heifers Stanwick Rose and Gaiety Sixth.—The portraits represent two very pretty Shorthorn heifers exhibited at the Perth show of the Highland Agricultural Society, by Mr. James Whyte, of Aldro, Darlington, which took the first prize in the classes for yearling and a two-year-old Shorthorn heifers respectively. The older heifer is Stanwick Rose, by Lord Godolphin (36065), dam Moss Rose by Baron Killerby (27949).

The yearling is Gaiety Sixth, by Ben Brace (30524), dam Gaiety by Merry Monarch (22344).

Shorthorn cow April Rose.—The favorite old "Mossrose" cow April Rose, having ceased to breed, has gone to the butcher. This cow was remarkable, not only for her personal merits, which were very great, but for the excellence of her progeny. Calved in April, 1862, she brought her first calf in August, 1864, and her thirteenth and last in 1876. Among the best of her produce were the following: A white steer, calved in 1865, that gave remarkable promise for Christmas honors; but he went wrong before the shows, and when slaughtered, a large stone was found in his stomach. Twin steers in 1867. One of these won the prizes for best Shorthorn and for best ox or steer in any of the classes at Birmingham; also the Champion cup and gold medal for the best beast in the yard at Smithfield, 1871; and further distinguished himself in the hands of Mr. Morrison in 1872. Flower Girl, by James First (24202), won first prize as calf at Manchester "Royal;" and among her many other prizes was first as breeding cow at the Bath and West of England at Dorchester. Passion Flower, own sister to the above, was never shown, but was the *ac plus ultra* of a Shorthorn. Village Rose, another own sister, won the first prize as calf at the Yorkshire; first at the Bath and West of England as a yearling; and second at Cardiff "Royal," where she was sold to Mr. Cochrane, Canada, for 300 guineas. Since these, April Rose has produced two heifers and three bulls, one of the former, March Rose, by Protector (32221), is still in the herd; two of the bulls died young, but Expectation (38244) is being largely used in the Duffryn herd.

Shorthorn bull Duke of Howl John.—This white bull is Mr. John Vicker's Duke of Howl John, a not euphoniously named, yet a remarkable animal. He was six years two months three weeks two days old when his photograph was taken. How well he has held together during that long fattening time, his portrait tells. He represents the mixture of Bates blood (in a small indirect infusion) with that of the elder Mr. J. Booth. The earliest named dams came from Killerby, the latest sire from Mr. Barnes, of Westland, Meath. The bull himself has attained great distinction. Almost every recent English show of "first" class has seen those victorious which were placed below him at Carlisle; yet Duke of Howl John, by his selection by a quite competent bench was preferred to all of them.

It is not to be expected that such a success should be at once accepted as deserved by everybody. Yet it would puzzle the critics who challenge the decision to find more fault in the Duke of Howl John as a breeding animal (about whom the ugliest point is his name) than can be pointed out in any of his defeated rivals. His rough shoulder points are his most conspicuous defects; and this is probably owing to his sire, White Duke, who inherited the blood of Grand Duke Third. Yet the presence of these shoulders, would seem to imply great masculine vigor. At all events, unsightly as they are, the

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animals which have this conformation have generally extra strong constitutions. Duke of Howl John has besides, through his grandsire, the blood of the Townley Richard Cour de Lion, whose use by Mr. Eastwood was believed, by the late Mr. Pawlett, to have been the means of invigorating that branch of the Bracelet tribe which came into his possession. It furnished the bull Baron Killerby, to which the Beeston herd owed so much. It undoubtedly would be preferable to obtain a bull for the showyard without rough shoulders, and also for use at home. But rough shoulders should be accepted with something more than toleration when the animal which has them brings into a herd fecundity and length of days. The photograph successfully represents a very massive, well-made animal.

Shorthorn cow Baroness Oxford Third.—We give the likenesses of two of the most fashionably-bred specimens of Mr. T. Holford's herd. The cow (whose head is fairly represented) is Baroness Oxford Third, a granddaughter, in direct line, of the celebrated old Holker cow, Lady Oxford Fifth. Baroness Oxford Third is by the famous Kingseote sire, Duke of Hilhurst.

Shorthorn bull Duke of Leinster.—The young bull is Duke of Leinster. He is a grandson (by his sire) of the cow of which we have just been speaking; but, on his dam side, he is of the Airdrie family of Mr. T. Bates's "Duchess" tribe. His dam, Duchess of Airdrie Seventh, was bred by Mr. Albert Crane, Kansas, United States of America.

Shorthorn cow Matchless Fifth.—The portrait represents Mr. E. C. Tisdall's cow Matchless Fifth, shown at the Agricultural Hall at the recent dairy show, which took the champion prize as the best dairy cow in the yard. We heartily join in the congratulations which Mr. Tisdall has received from his many friends upon his success. It is a happy and most welcome fortune that one who has shown so much public spirit in the thankless and laborious work of establishing and guiding a great national institution such as the dairy association must become, should himself reap the highest honor awarded by the society's judges at its annual exhibition. Of the cow herself the best account is given by her well-known breeder, Mr. Hobbs, of Maisey Hampton, Gloucestershire: "The first prize cow, Matchless Fifth, at the London Dairy Show in the shorthorn class being bred by me, and in my possession until within two months, enables me to certify as to her good milking qualities. When newly calved she has produced twenty quarts per day, and yields a good supply through the whole of the season. The judges appear to have looked on hersquare, well-shaped udder as indicative of a good milk producer, although her last calf was dropped on November 1, 1880. She is by a bull bred by Mr. Edward Bowly of his Gazelle tribe." This is one of Mr. Stacey's photographs.

Shorthorn cow Generous.—The following note is from the Herdsman: The cow Generous, in the Ratton Park herd, near Eastbourne, was bought for 300 guineas in September, 1878, direct from Mr. J. B. Booth. She is of the same tribe as Mr. St. John Acker's cow Queen of the Georgians. We give an engraving of Generous, from her photograph, with her last year's heifer calf, Georgia Regia. She is by King of Trumps (31512), calved March 12, 1879.

Shorthorn bull calf Acropolis.—Shorthorn bull calves at York were represented in a class of many entries; but the stalls showed several gaps. Oddly enough, all the winners of prizes were outsiders. Mr. R. Stratton's capital young bull Acropolis (one of the younger) was put first. We have here a capital portrait.

Shorthorn dairy cows (Mr. Birdsey's and Mr. Taylor's).—These portraits represent two of the late dairy show winners, in one of the best classes in the hall, i. e., No. 3, Shorthorns for which no pedigree is asked. In many country districts cattle of this stamp are reared, generally by pedigree bulls from cows which were similarly bred, but of whose breeding no authentic record has been preserved. These really are milking Shorthorns in proper condition to exhibit at a dairy show. The darker roan is Beauty, No. 22 in the catalogue, and the property of Mr. Thomas Birdsey, of Southcote Farm, Leighton, Beds. She was awarded the highest place. The lighter colored animal was put second by the judges, but was preferred by not a few of the lookers-on, and her yield of milk proved rather the larger in amount. She, too, is called Beauty, and was shown as No. 35, and is the property of Mr. George Taylor, of Stanton Priors, near Bristol. Although not extraordinary, these are good specimens of the milking Shorthorns, such as exist on hundreds of farms, where this most serviceable variety is cultivated.

Shorthorn cow Red Cherry.—The portrait represents the second prize cow, Red Cherry the property of Mr. Joseph Phillips, in the class of dairy cows at Reading. It has evidently been taken when the udder was empty, and thus it does not compare so favorably as it might with portraits given elsewhere of cows in the same class which received no award. The judges, however, have no doubt been guided, as in our opinion they always ought to be, by the other elements besides milk which go to make up the character of a cow for the dairy. Mr. Phillips's large and massive Shorthorn cow, though it does not promise milk produce either so large or so good as that of the Guern-

sey, or that of the Ayrshire, is likely to be on the whole a better animal for the ordinary cheese or butter dairy in a fairly fertile district. Its superior capability of converting food into beef, after it has done its work as a milk producer, makes it the best of the three as a dairy cow in the opinion of the society's judges.

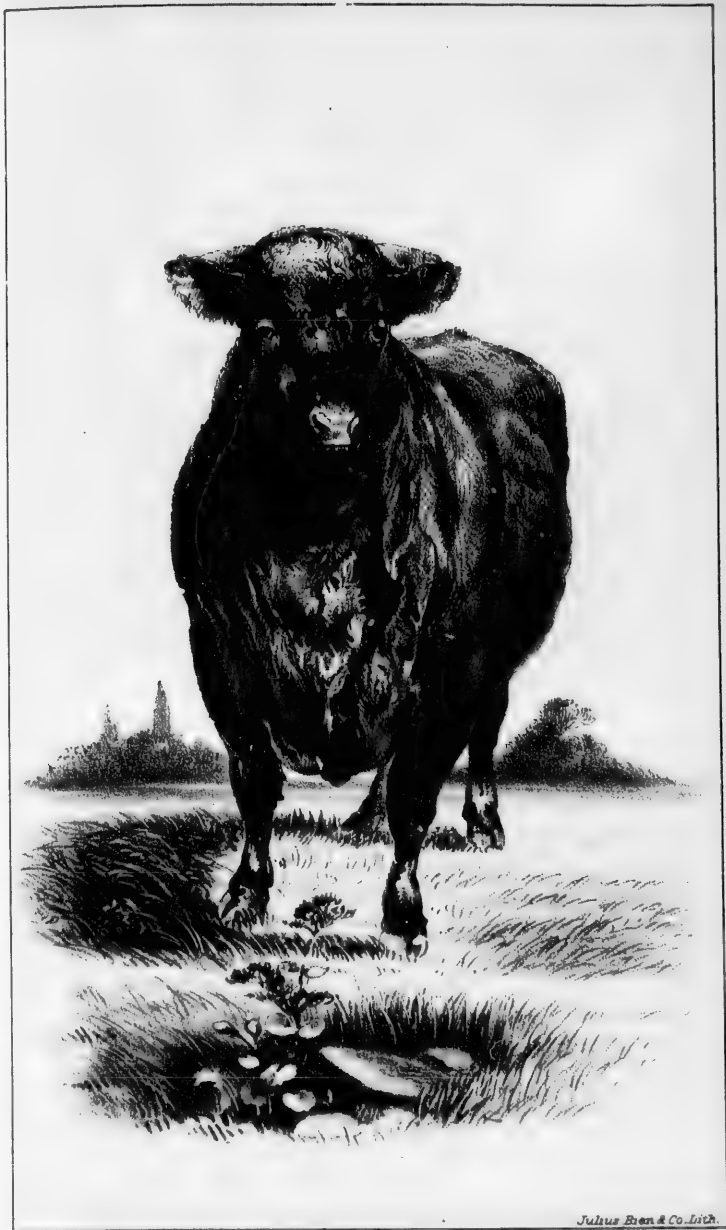
Shorthorn cow Innocence Second of Naseby.—Innocence Second of Naseby was calved June 20, 1880. Sire, Earl of Geneva (33794); dam, Innocence, by Telemachus Third (32650).

Shorthorn bull Sir Simeon.—The celebrated bull Sir Simeon (42,412) whose portrait is given in page 89, was bred by Mr. Aylmer, and calved January 16, 1878. He is by Mr. Booth's Sir Wilfrid from Foreign Beauty, which was bred by Mr. W. Torr, and purchased by Mr. Aylmer, when a handsome calf, at the great Aylesby sale, 1875, for 500 guineas. Hitherto she has produced only bulls, which have been sold for large sums; Mr. John Peel purchased one of them for his herd at Knowlmers. Sir Simeon is a deep rich red in color, of large scale and great substance, and walks like a thoroughbred animal. He has what those old judges who founded the breed considered a great attribute—a fine large masculine head, with a pair of strong, rather upstanding horns. His appearance indicates vigor and fine constitution; his ribs are round and deep, but his long hind quarters and full thighs are somewhat dwarfed by hips a little too prominent. Mr. Teasdale Hutchinson, of Catterick, whose career as a farmer, breeder, and exhibitor has rarely been equaled, offered 500 guineas for him when a yearling; but his superior merit and high lineage induced Mr. Aylmer to keep him at home for his own herd. It is to this bull that the Duke of Manchester's two best Oxford cows of Bates's blood, as well as other highly bred animals, have been sent for service. He was sold last autumn to Mr. W. Talbot Crosbie, for his extensive herd at Ardfert Abbey, Ireland, to which place the bull will be taken, early next spring, should disease regulations permit.

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THE EARL OF BECTIVE'S SHORTHORN BULL
 "DUKE OF UNDERLEY"

SHORTHORN HEIFER "LADY VIOLET"

Julius Rosen & Co. Inc.



Julius Bien & Co. Lith

SHORTHORN HEIFER "LADY VIOLET"

SHORTHORN HEIFER "LADY VIOLET"



Julius Ben & Co Lith

SHORTHORN HEIFER "LADY VIOLET".

LORD RATHDONNELLS SHORTHORN BULL "ANCHOR"



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LORD RATHDONNELLS SHORTHORN BULL "ANCHOR"

LORD EXETER'S SHORTHORN BULL "TELEMACHUS"



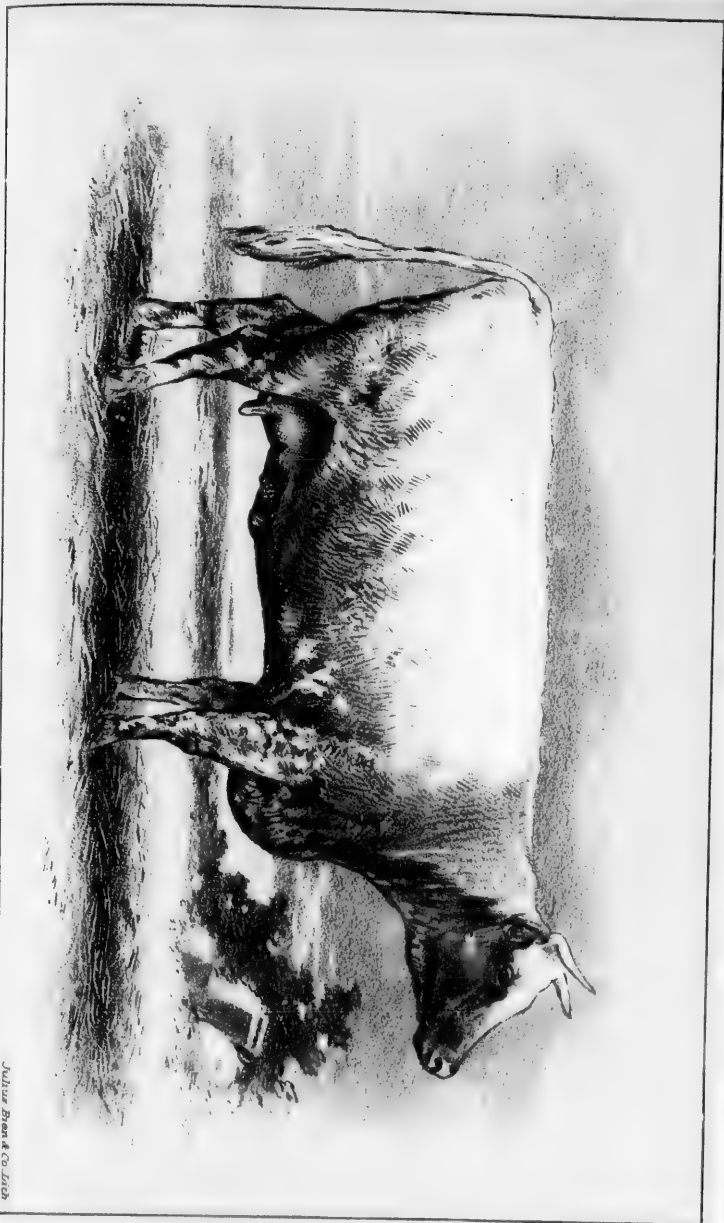
LORD EXETERS SHORTHORN BULL "TELEMACHUS"

MR ST JOHN ACHERS SHORTHORN COW LADY CAREW



MR ST JOHN ACHERS SHORTHORN COW LADY CAREW

MR. F. HARVEY'S SHORTHORN COW, "VICTORIA"



MR. F. HARVEY'S SHORTHORN COW, "VICTORIA."

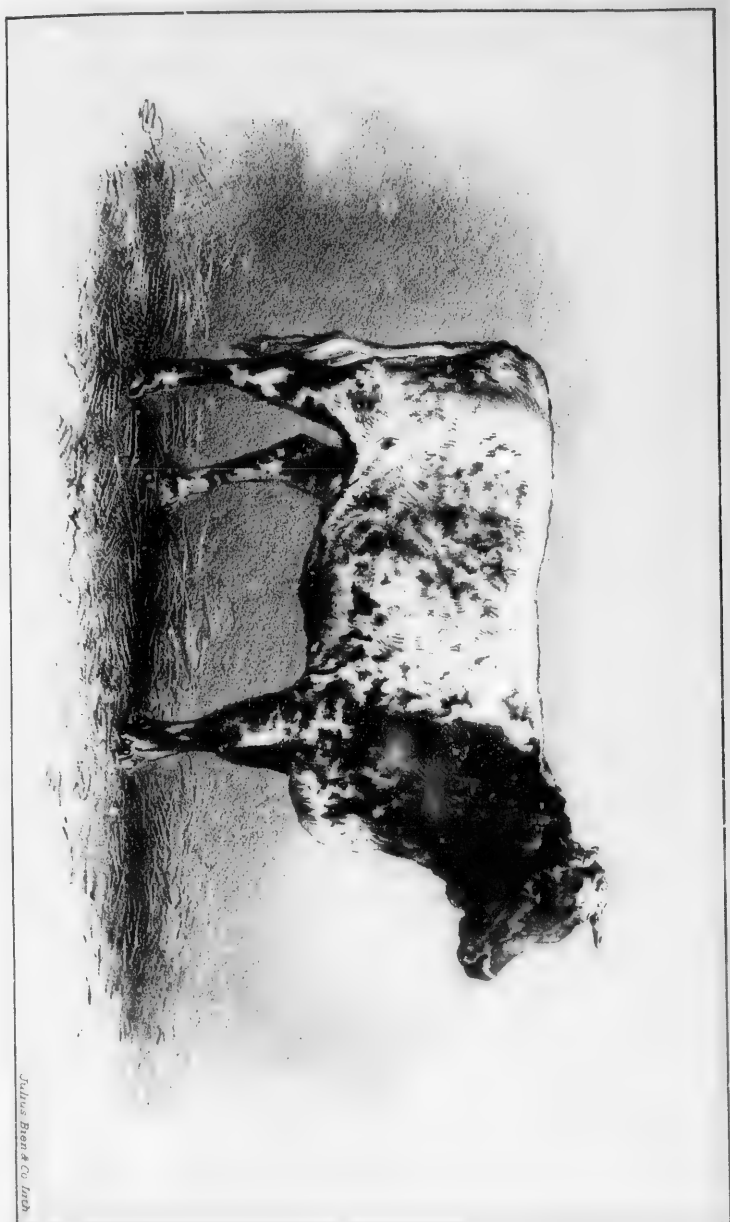
MR. W. STRATTON'S WHITE DAIRY COW, "MAIDEN"



MR. W. STRATTON'S WHITE DAIRY COW, "MAIDEN"

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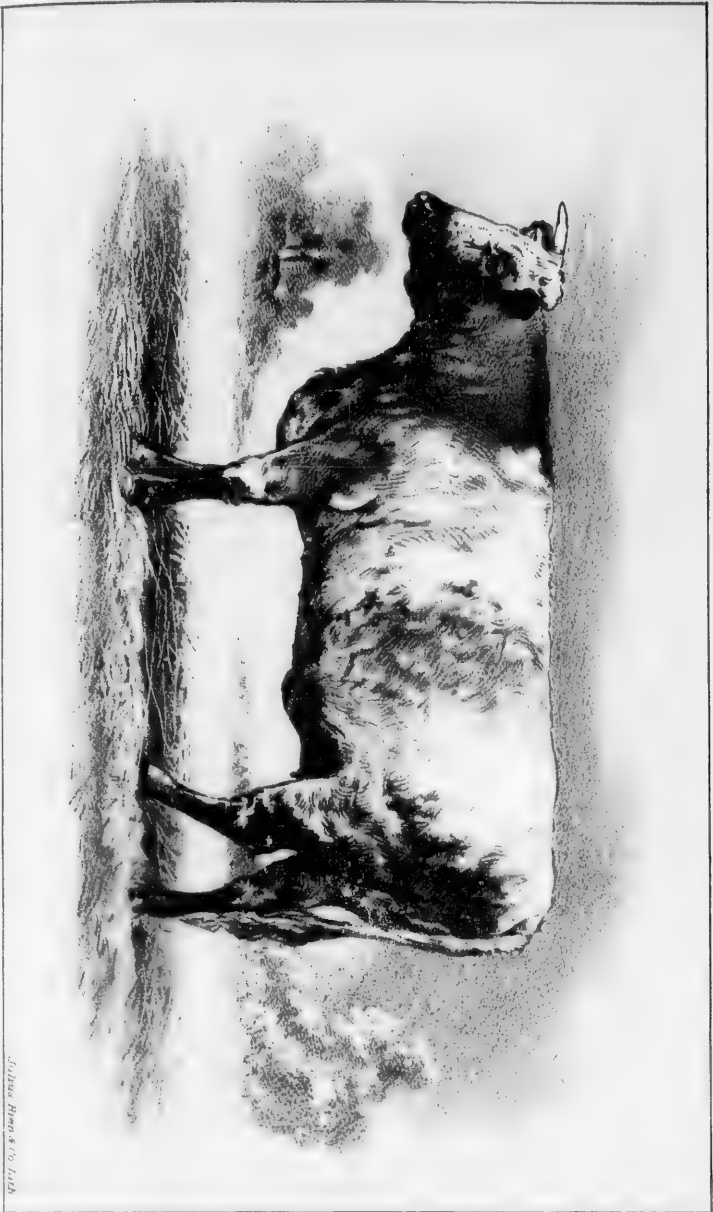
MR. JAMES WHYTE'S YEARLING SHORTHORN HEIFER,
"GAIETY 6TH," 1ST AT PERTH.



James Benn & Co. Lith.

MR. JAMES WHYTE'S YEARLING SHORTHORN HEIFER,
"GAILETY 6TH," 1ST AT PERTH.

MR. JAMES WHYTE'S 2-YEAR-OLD SHORTHORN HEIFER,



MR. JAMES WHYTE'S 2-YEAR-OLD SHORTHORN HEIFER,

MR. STRATTON'S SHORTHORN COW "APRIL ROSE"



MR STRATTON'S SHORTHORN COW "APRIL ROSE"

SHORTHORN BULL DUKE OF HOWL JOHN

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SHORTHORN BULL DUKE OF HOWL JOHN



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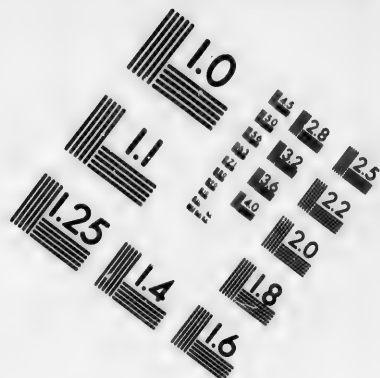
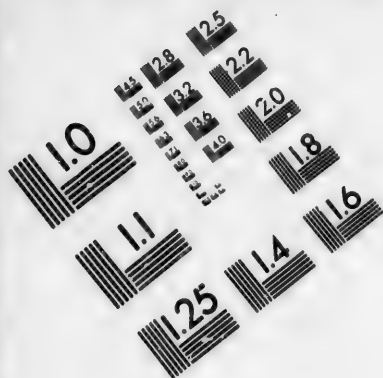
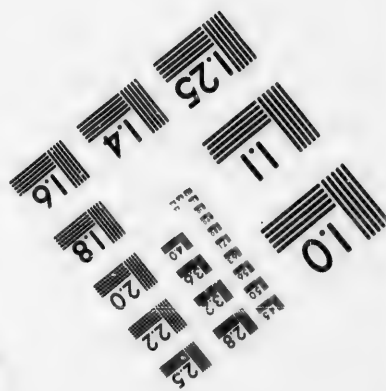
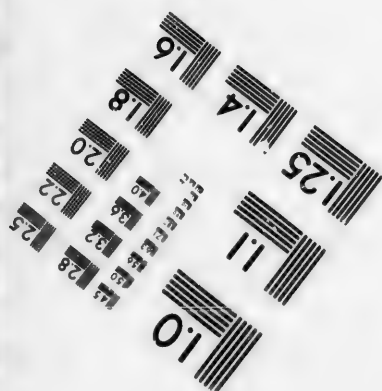
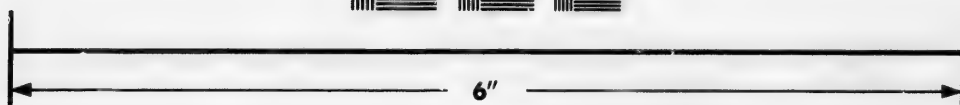
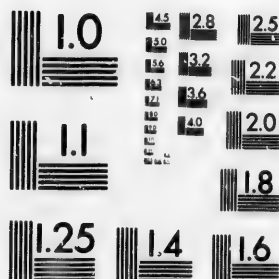


IMAGE EVALUATION TEST TARGET (MT-3)



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HEAD OF SHORTHORN COW



HEAD OF SHORTHORN BULL



J. H. Smith & Co. Lith.

HEAD OF SHORTHORN BULL





SHORTHORN COW "MATCHLESS"

SHORTHORN COW "GENEROUS"

JULIUS PRINZ & CO. LTD.



Julius Ben & Co. Lith.

SHORTHORN COW "GENEROUS"





Julius Bien & Co. Lith.

MR. R. STRATTON'S SHORTHORN
BULL CALF "ACROPOLIS"

COL. GUNTER'S SHORTHORN BULL "NINTH DUKE OF TREGUNTER"



Julius Bien & Co. 1917

COL GUNTER'S SHORTHORN BULL "NINTH DUKE OF TREGUNTER"



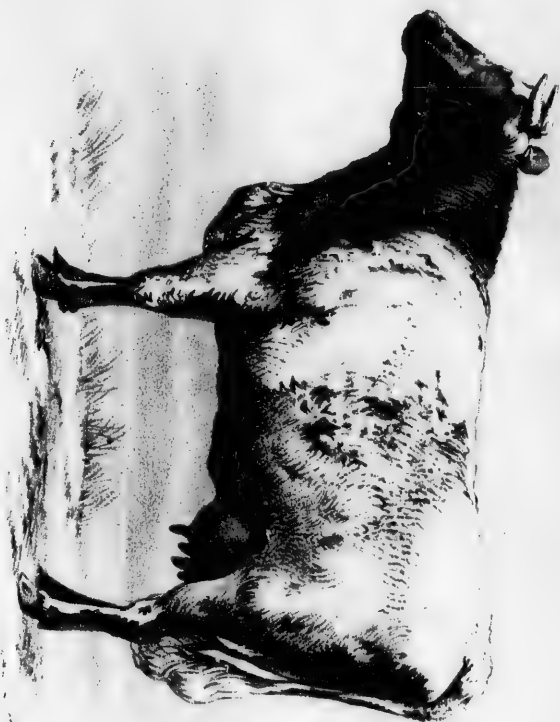


"Duchess One Hundred and Nineteenth"

COL GUNTER'S SHORTHORN COW "DUCHESS ONE HUNDRED AND NINETEENTH"

MR. BIRDSEY'S SHORTHORN COW "HONESTY"

Julius Brand & Co. Inc.



MR. BIRDSEY'S SHORTHORN COW "HONESTY"

Julius Bend & Co. Lith

MR. BIRDSEY'S DAIRY COW
FIRST IN HER CLASS AT ISLINGTON.



Julius Ben & Co. Lith.

MR. BIRDSEY'S DAIRY COW
FIRST PRIZE CLASS AT CINCINNATI

MR. TAYLOR'S DAIRY COW

Julius Rosen & Co. Inc.



MR. TAYLOR'S DAIRY COW

Julius Bean & Co. Lith.

SHORTHORN COW "RED CHERRY"

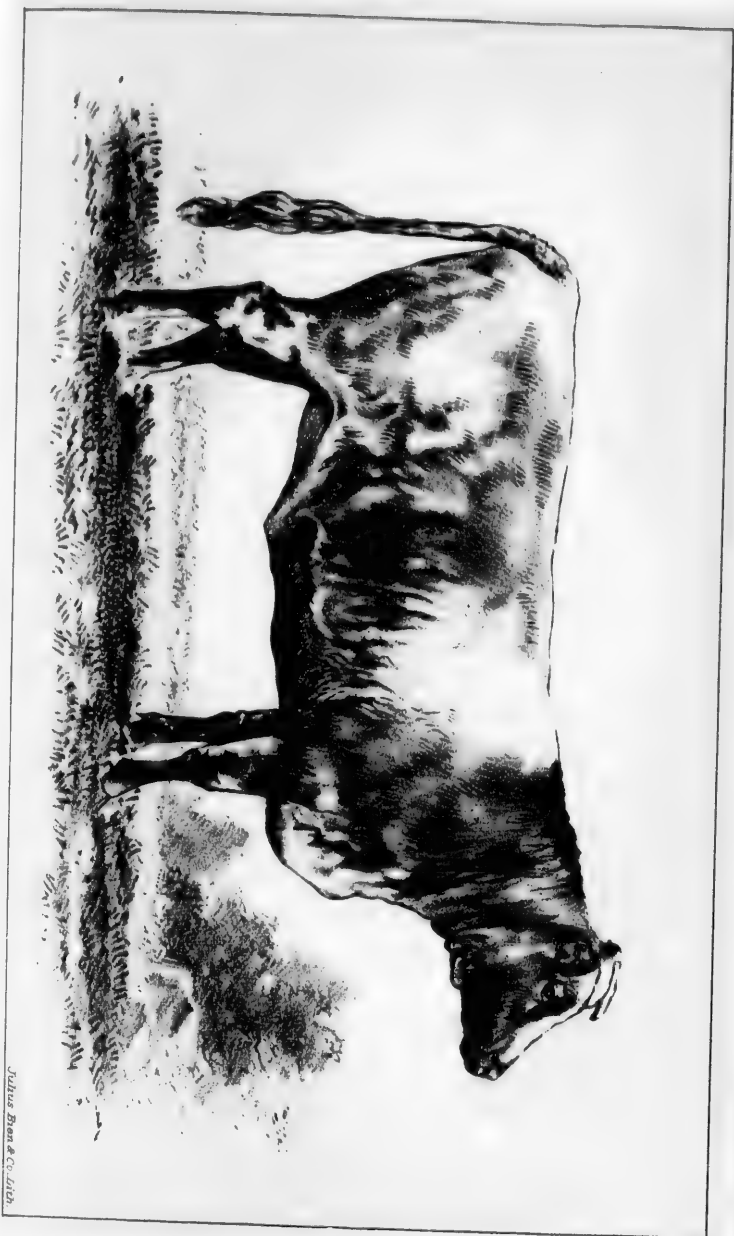


SHORTHORN COW "RED CHERRY"

Julius Benck & Co. Lith.

"INNOCENCE 2ND OF NASEBY"

Julius Rosen & Co. Lith.



"INNOCENCE 2ND OF NASEBY"

Julius Pien & Co. Lith.

"MAY DUCHESS FIFTEENTH"



"MAY DUCHESS FIFTEENTH"

Julius Brund & Co. Lith.

MR. HUGH AYLMERS, SIR SIMEON



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PORTRAITS OF BRITISH PRIZE CATTLE—Continued.

B. DEVON CATTLE.

Devon cow Phlox.—The portrait represents Mr. Rolles Fryer's Devon Phlox and her calf. The calf is a charming little heifer by Mistletoe. Phlox won first prize, 1883, at the Devon County show, competing in the class of heifers a year older than herself; first at the Bath and West of England at Cardiff; first at the Royal Cornwall at Launceston; and third at the Royal of England at Reading.

C. SUFFOLK CATTLE.

Suffolk cow Wild Rose.—The portrait represents Wild Rose, a 10-year old Suffolk cow, the property of and bred by Mr. George Gooderham, Monewden, Wickham Market, Suffolk, calved April 10, 1874. Sire, The Claimant; dam, Rosy by Perfection; grand-dam, Beauty by Wander.

Produce: January 5, 1878, Wild Rose of Kilburn; April 9, 1879, Wild Robin; April 14, 1880, Wild Rover; April 29, 1881, Wild Rupes; March 10, 1882, Wild Rosy; March 7, 1883, Wild Ruth.

This cow has been shown three times for the milking test at the Suffolk Agricultural Association, and has gained one first and two second prizes against all breeds, and has never been beaten by a red polled for milking purposes. She gave at Woodbridge and Beeches 26 pints in twelve hours. At home she daily gives 54 pints for the first four months after calving; and as 20 pints of her milk make 1 pound of butter, this proves that she has made nearly 19 pounds per week for sixteen weeks. She is now (August) giving 40 pints per day, and makes 14 pounds of butter weekly. It is worth noticing that this proportion (*i. e.*, 1 pound of butter for 20 pints of milk), is exactly the same as that from Shorthorns (reported from the Journal of the Royal Agricultural Society of England, near Hull).

D. LONGHORN CATTLE.

Longhorn bull Prince Victor.—The portrait represents Prince Victor, a longhorned bull owned by Maj. Gen. Sir F. W. Fitzwygram, Bart., of Leigh Park, Havant, Hants; five years and three months old, bred by Mr. Shaw, Fradley Old Hall, Lichfield—by Earl of Upton 7th (76), dam Princess. This engraving is reproduced from a very admirable photograph taken in the Kilburn show-yard for the Mark Lane Express. Prince Victor took the first prize in his class at the meeting of the Royal Agricultural Society at Kilburn last year.

Longhorn cow Calke.—The portrait represents Mr. Richard Hall's longhorn cow, Calke, which took the first prize in her class—"cows in calf or in milk above three years old," at the Bristol show of the Royal Agricultural Society. The breed has distinct dairy aptitudes, and this cow in particular is evidently a good dairy cow. The photograph has done fair justice to the cow, and the engraver has copied it to accuracy.

E. HEREFORD CATTLE.

Hereford bull Thoughtful.—Here we have an uncommonly successful drawing of a good Hereford, given as representing a meat-making breed. The steers of the breed are quite as massive—quite, we think as good in rib and sirloin and rump, where the best beef grows, as any other breed, the Shorthorn included.

Mr. Taylor's bull did not take the first prize at the Kilburn show. In the class for bulls above three years old, the well-known prize-taker Grateful, bred by his exhibitor, Mr. Aaron Rogers, of the Rodd, Kingtor, Herefordshire, took first honors. Thoughtful was placed second to him; he is better behind, but not so good as Grateful in his fore flank.

Hereford heifer Leonora.—At the late Bristol shew of the Royal Agricultural Society of England, Mrs. Edwards was prominent with her beautiful pair of heifers. There was no finer animal than Leonora there; none carrying and capable of carrying such a wealth of meat on legs so short. Fortunately for the country, old Winter de Cote left something more than a good name, and any young breeder need not feel disgraced to be near such stock as the half sisters, Beatrice and Leonora.

F. SUSSEX CATTLE.

Sussex heifers.—The Sussex is—like the Aberdeenshire Poll—the “coming animal” for farmers only in those districts where cattle-breeding is distinct from dairying. But it seems certain that it can add size and deep flesh to many herds, which are kept in remote places, under the natural conditions of having “to prog for oneself.” With its somewhat thick (though supple) skin, hard hair, and great activity, it seems quite the animal for the bush, the backwoods, or the rough land now being laid down to grass because it cannot find a tenant. The portraits are capital representations of a most useful kind of grazing stock.

G. AYRSHIRE CATTLE.

Ayrshire cow Jane.—Mr. George Ferme's Jane was the first prize Ayrshire cow in class 5 at the Autumn Dairy Show at Islington. Jane is about 5 years old, breeder unknown. She is a capital specimen of the Ayrshire breed.

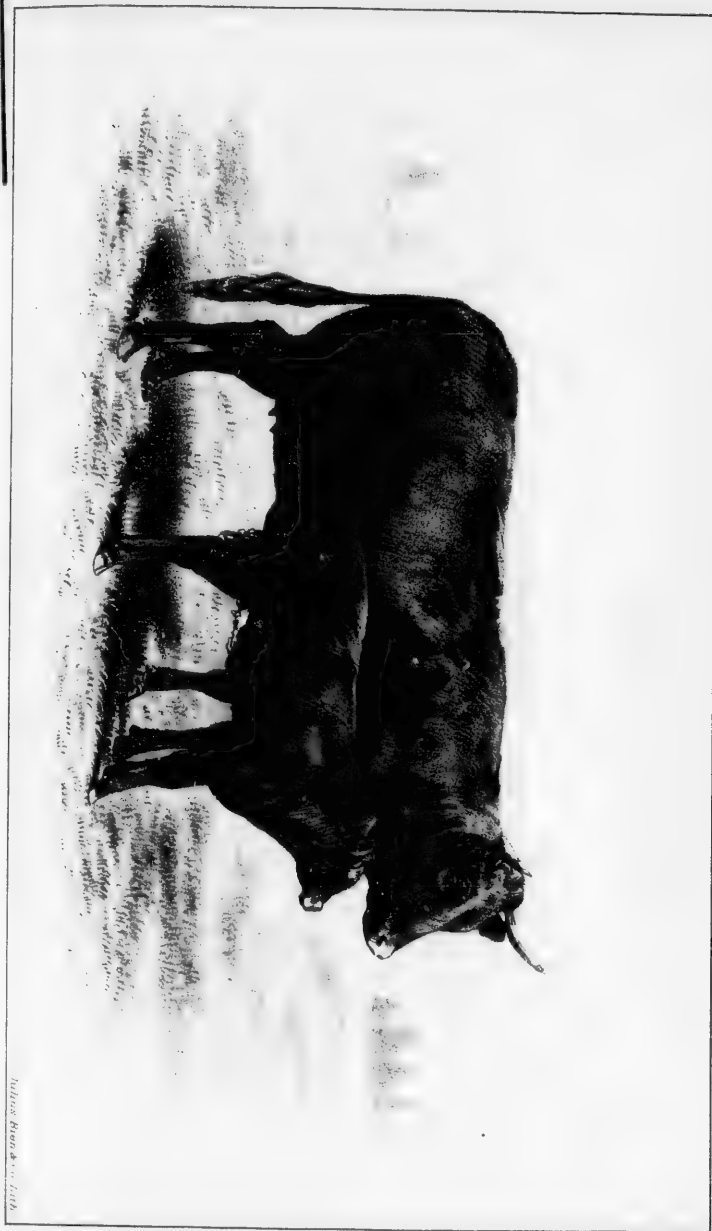
Ayrshire cow.—The portrait represents a capital dairy cow of the Ayrshire breed, and, as can be seen from the engraving, a good specimen of that admirable dairy breed; she yet remained undistinguished in the midst of a large class, not expressly of Ayrshire cattle, but of dairy cattle of any breed or cross-breed at the Reading Show, so good a representation did it give of the best dairy cattle in the country.

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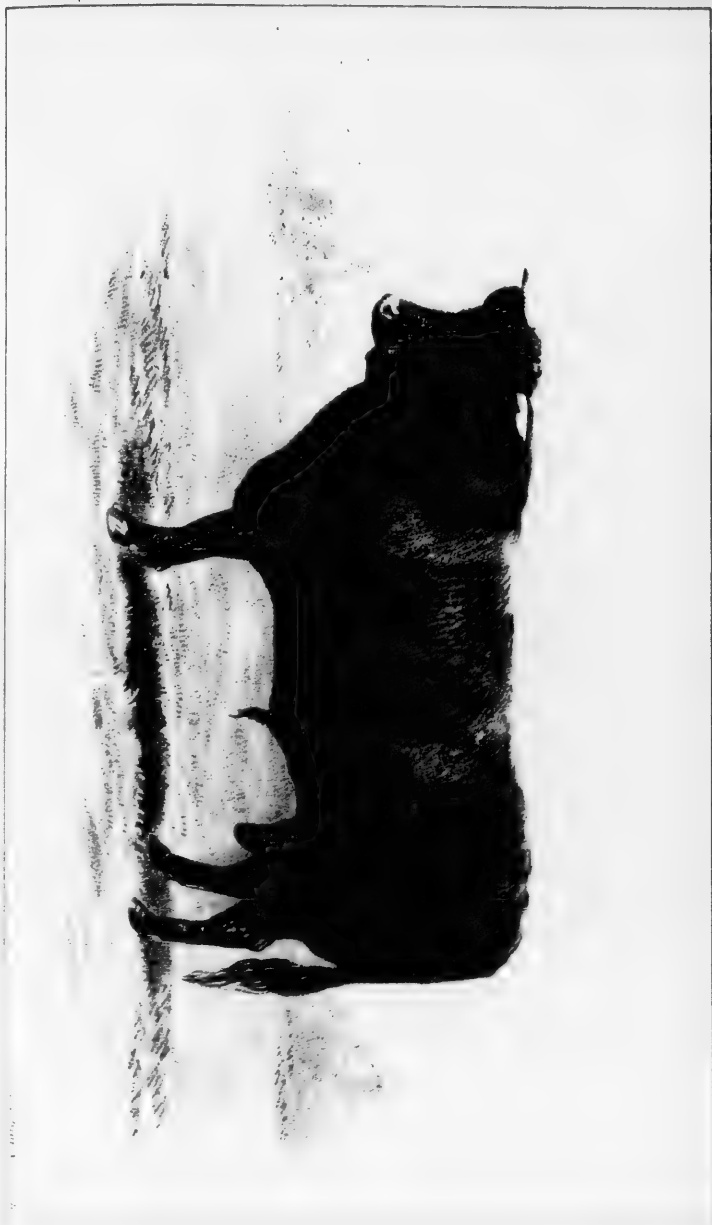
MR ROLLES FRYER'S DEVON COW "PHLOX"



Rolls from the 1870s

MR ROLLES FRYER'S DEVON BULL SWIFT WILLIAM

MR. ROLLES, FRYERS, DEVON BULL SWIFT WILLIAM



SIR W. R. WILLIAMS' DEVON COW "TEMPTRESS 8TH"



Johns River & Co. Ltd.

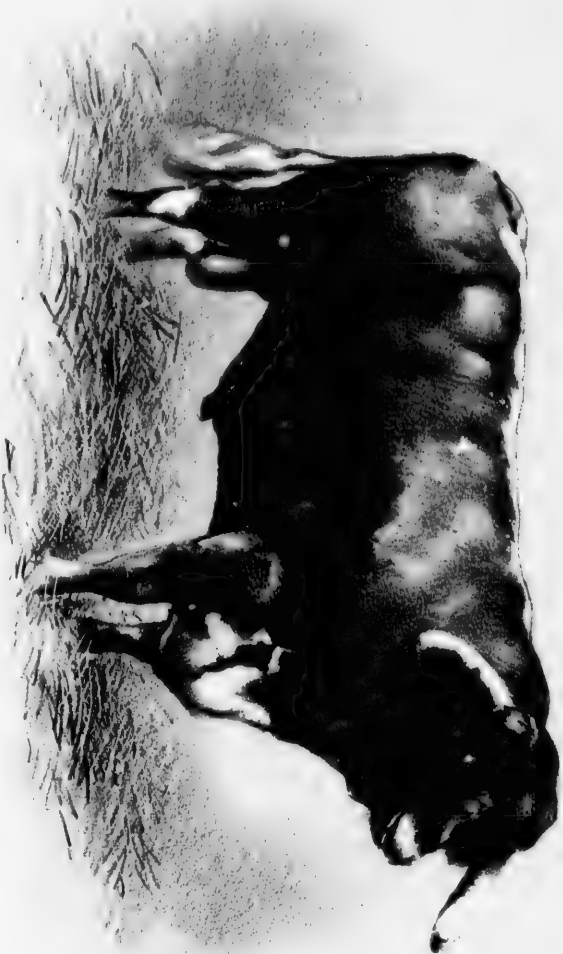
SIR W. R. WILLIAMS' DEVON COW "TEMPTRESS 8TH"

MR. GOODERHAM'S SUFFOLK COW "WILD ROSE".



MR. GOODERHAM'S SUFFOLK COW "WILD ROSE"

LONGHORN BULL "PRINCE VICTOR"



Julius Riedel & Co. Lith.

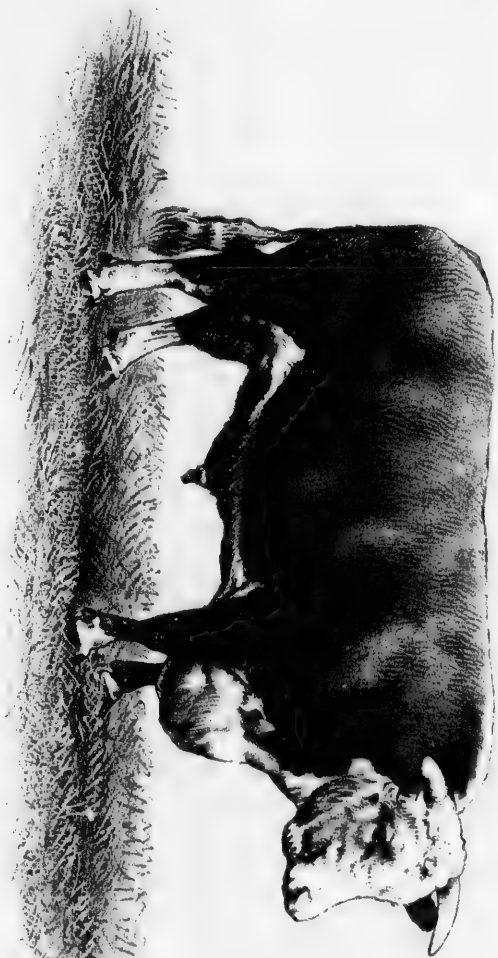
LONGHORN BULL "PRINCE VICTOR"



Julius Bonk Co. Lith.

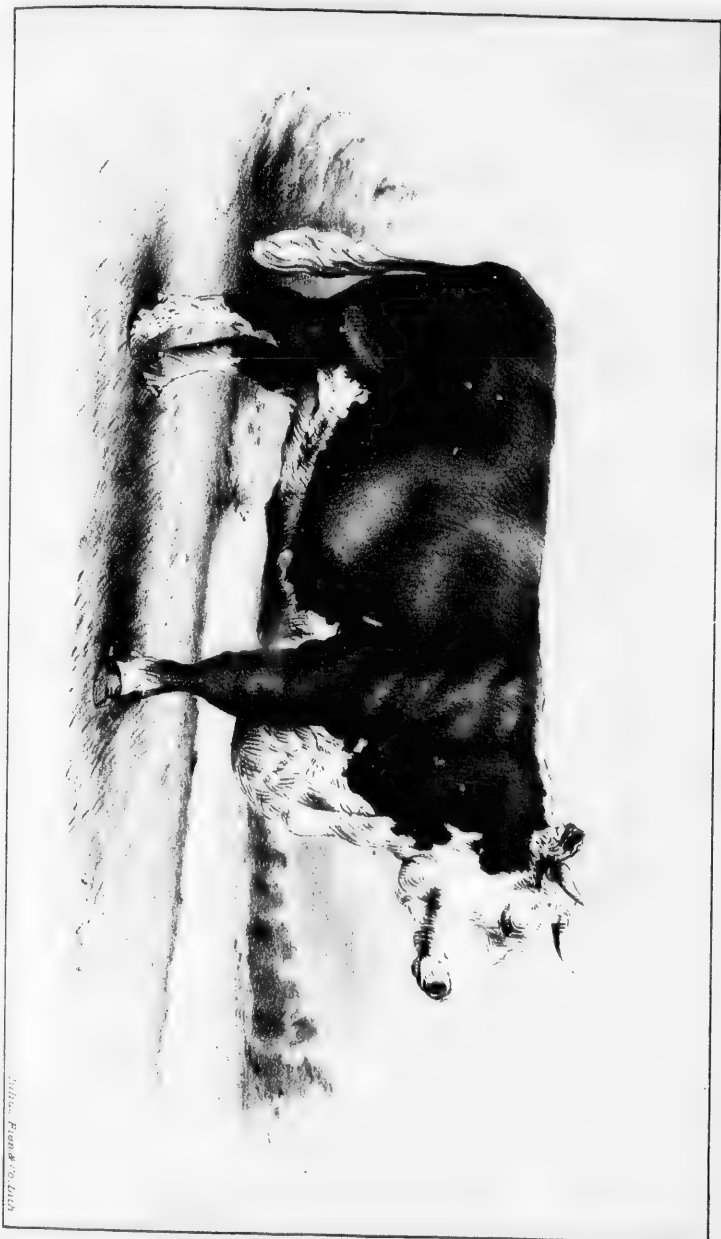
LONGHORN COW "CALKE"

MR TAYLOR'S HEREFORD BULL "THOUGHTFUL"



MR TAYLOR'S HEREFORD BULL "THOUGHTFUL"

Julius Bon & Co. Lith.



John. P. H. L. L.

MRS. S. EDWARDS' HERFORD HEIFER "LEONORA"

MESSRS. HEASMAN'S SUSSEX HEIFER



Julius Runk & Co. Lith.

MESSRS. HEASMAN'S SUSSEX HEIFER

MR. J. S. HODGSON'S SUSSEX HEIFER

Julius Rosen & Co., Ltd.



MR. J. S. HODGSON'S SUSSEX HEIFER

Julius Ben & Co. Lith.

AYRSHIRE COW "JANE".

Julius Green & Co. Lith.





AYRSHIRE COW "JANE".

Julius P. B. & Co. L. O.

AYRSHIRE COW



Julius Brent & Co. Lith.

AYRSHIRE COW

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PORTRAITS OF BRITISH PRIZE CATTLE—Continued.

H. JERSEY CATTLE.

Jersey heifer and calves.—The portrait represents a heifer with calves of the Jersey breed, taken by instantaneous photography by Messrs. Scheiber & Son, of No. 818 Arch street, Philadelphia. Their sire was bred by Mr. E. Gibbrou, St. Lawrence, Jersey, and was winner of his parish prize when about ten months old, having had at that age accorded to him twenty-eight out of the thirty-one points in the Jersey scale; then winner of first prize, as three years old, at State Fair at Utica, September, 1870, heading the prize herd. He was sold to Mr. E. Delafield Smith at \$600. It will be seen in the sketch that the fore legs of the older calf or heifer cover one another. Her proper left fore leg touches the ground behind the other, and an awkward appearance of width in the two legs, which are hardly distinguishable above the knee, is thus explained.

Jersey cow Velveteen.—The portrait represents Mr. John Cardus's Jersey cow Velveteen, which took the first prize in the cow class, and not that of Dorothy. Mr. Cardus sent three animals (of six entries) to the show, and was awarded first prize for Velveteen in the cow class; second prize for Snowflake in the heifer class, under three years, but over two years old; and first prize for Dorothy among the young heifers. Velveteen was seven years old in June last. She was selected in the Island of Jersey by Mr. E. P. Grey Prince (168), Jersey Herd Book foundation stock, out of Valentine (734), bred by Mr. Le Brocq, St. Peter's Jersey. She was not, however, allowed to go to America, for Mr. C. B. Dixon (late of the Vinery, Shirley, Southampton) picked her out from some twenty or thirty others in the Southampton Docks, and rescued her from expatriation, and after breeding two calves for him, Mr. Cardus bought her in the autumn of 1879. She calved in July, 1880, a heifer calf, Vixen, who took the first prize at the Royal Agricultural Show at Derby, in 1881, in the heifer-calf class, and was highly commended at the Dairy Show, Islington, in 1882. In July, 1881, she produced Victress, who took first prize at the Royal Counties Society's Show at Winchester, in 1883, and was highly commended at the Royal Agricultural Show at Reading, in 1882. In 1882 she calved prematurely a bull calf, killed; and this year, 1883, she produced a heifer calf, Velvet. Vixen, her calf of 1880, was by Dairy King (211), and her calves of 1881, 1882, and 1883, by Baron Lionel (994), son of Dairy King.

Jersey cow Alice.—Alice was 2½ years old at the time the portrait was taken; she was bred by Mr. F. Le Brocq, St. Peter's, Jersey.

Jersey cow Longueville Belle.—The portrait is a very successful representation of the very beautiful Jersey cow bred by Mr. Laurens, of Longueville, St. Saviour's, Jersey, and exhibited by Mr. James Blyth, of Woodham, Stanstead, Essex, at the Royal Agricultural Society show, where she was highly commended in her class, being then a three-year old in calf, having previously calved in August, 1880.

Jersey cow Coomassie.—This cow (the property of Mr. S. M. Burnham, Saugatuck, Conn.) is numbered 1442 in the "Foundation Stock" of the Jersey Herd Book, and 11874 A. J. C. C. H. R. She was calved in 1871, and won five prizes on the Island in as many successive years, 1876-1880 inclusive—first in the young cow class, then as an "old" cow, and the last three times as the "champion," besides four first parish prizes from 1874 to 1876. She brought with her from home the following remarkable butter record: In seven days in 1878, 14 pounds 15 ounces Jersey, equal to 16 pounds 11 ounces American; in 1879, 14 pounds 11 ounces Jersey, equal to 16 pounds 7 ounces American; and in 1880, 14 pounds 13 ounces Jersey, equal to 16 pounds 9 ounces American. It should be added also that the photograph was taken four months after calving, when her milk production was past its height. —*Albany Cultivator, U. S. A.*

Guernsey bull and cow.—The portraits represent a bull and cow of the Guernsey breed shown at Tunbridge. The bull is Squire of Vauxbelets, exhibited by Mr. James James, of Les Vauxbelets, Guernsey, taking the prize as the only bull in its class. The cow has been unfortunately misnumbered by the photographer. Perhaps the owner may recognize her from her very satisfactory engraving. We presume that she is a prize cow in class 60 or 61 of the Tunbridge Wells show. The engravings cannot represent in colors yellow and white which characterize the breed, but they can at any rate illustrate the form and beauty of the animals, and the milk-like appearance of the cow. They were in classes remarkable for number and excellence.

Guernsey cow Elegante.—The above is a plate of a Guernsey cow, now well known among Guernsey breeders—Elegante, No. 592 (No. 198 in the island registry). The engraving conveys a very accurate idea of her in all respects except color. Her colors are

pure white and light lemon fawn, and the latter is no darker on the head and neck than on the body. Her skin, as seen in the ear, the udder, and, in fact, on any part, is not nominally, but actually, that of gold, and it is not necessary to approach her or open the hair to see the glow.

I. WELSH BLACK CATTLE.

The Black cattle are natives of the counties of Pembroke, Carmarthen, and Cardigan, and are more generally known as Pembrokeshire Blacks, subdivided into Castlemartin and Dewsland breeds. From Cardiganshire they also extend along the North Wales coast up to Anglesea. Professor Wrightson, of the College of Agriculture at Downton, near Salisbury, considers that the Hungarian and Podolian cattle are of the same breed as the Black Cattle of Wales.

Mr. Richard H. Harvey, in his preface to the Welsh Black Cattle Herd Book, says the cattle are generally of black color. Occasionally there are some cows striped—red and black—also some quite white, with black ears, muzzle, and feet; but these are becoming very rare. The late Lord Dynevor had some very fine specimens of the white breed near Llandilo, and the five-year-old oxen were fine animals. The horns should be of a rich yellow; they are generally tipped with black, and do not come out yellow to the very end, like the Herefords. There is a different pitch of horn for bulls and cows. A bull's horn should be low, and well spread; the cow's narrower, and the pitch more upright.

The steers and oxen take more after the bull. This description applies in a great measure to the Anglesea cattle. They are, however, broader on the back, and shorter in the legs, with more hair. The heads are heavier and horns not so yellow.

To this description, however, Mr. Morgan Evans, who was a breeder of these cattle, took exception. He never saw a black cow with a dark-brown face.

They should have the hair long and wavy, neither short and crisp nor very curly. A brown-black wavy coat is to be preferred to any other. A white udder and a gray or white tuft of hair at the end of the tail is the only deviation from the self-color—black or brown-black—admissible.

The natural characteristics of the breed may be described as narrow on the shoulder and chine, slack on the loins, an inclination to be high on the rump, and flat-sided.

No cattle withstand cold and wet with greater hardihood than the Blacks. Their home is in a stormy clime, and the robust Blacks roam in the fields, their only shelter being the earth-banks of the inclosures. Cows and heifers frequently calve in the tempest or knee-deep in snow with apparent comfort, and without injury to their offspring.

Docility.—The docility of the breed is remarkable. A stranger may go safely into a herd of cows, but it is not safe to do so where there is a bull, unless accompanied by some person acquainted with its habits. Bulls, after they are one year old, should always be kept in the house, not only avoiding accidents, but enabling the farmer to regulate the times of calving. The cows stand very quietly to be milked in the yard or in the house, and with their large full eyes and quiet expression look the very picture of docility. They are most useful dairy stock, as they have a good flow of milk, of more than average quality.

Fattening.—It is admitted that the Black breed will fatten at an early age, and, when reared like the improved breeds, will make good weights. Looking at the soil, the climate, and the accommodation for them during the winter, they are the only breed that will pay the farmer's rent.

Mr. G. F. Bowden, of Somersal, near Derby, never ties up any of his cattle, only those he milks and finishes off for the butcher. The calves reared on their dam's milk at one year old are as big, better hair and coats, than those reared by hand at two years old. Other calves Mr. Bowden rears on skim milk, Simpson's calf meal, and a little dissolved oil-cake. For feeding purposes it is considered best to buy barren heifers and bullocks turned three years old.

Note, by Consul-General Merritt.—Another breed, the large Black or Runts, is of great size with immense horns. At the last Smithfield show, 1883, the heaviest beast was a Black Welsh.

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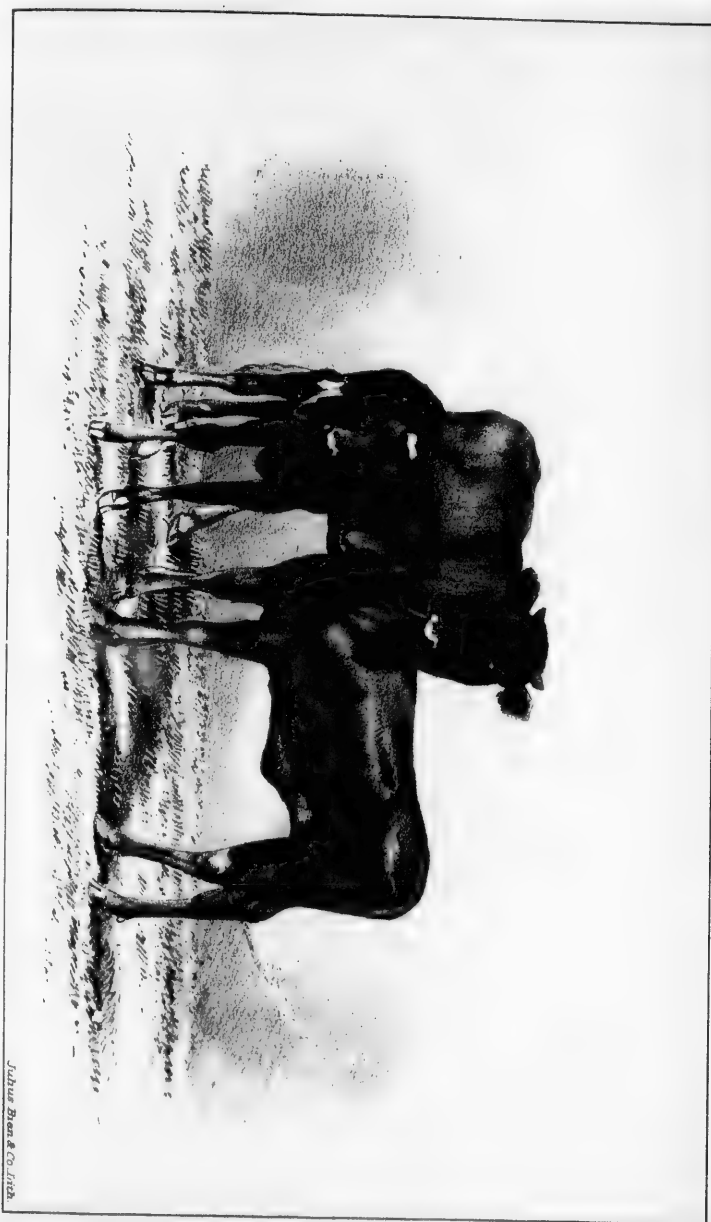
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JERSEY COW "VELVETEEN"



JERSEY COW "VELVETEEN"

MR. H. J. CORNISH'S JERSEY HEIFER "ALICE"

Julius Henck & Co. Inc.



MR. H. J. CORNISH'S JERSEY HEIFER "ALICE"

Julius Rasmussen & Co., Inc.

MR. JAMES BLYTH'S JERSEY COW "LONGUEVILLE BELLE"



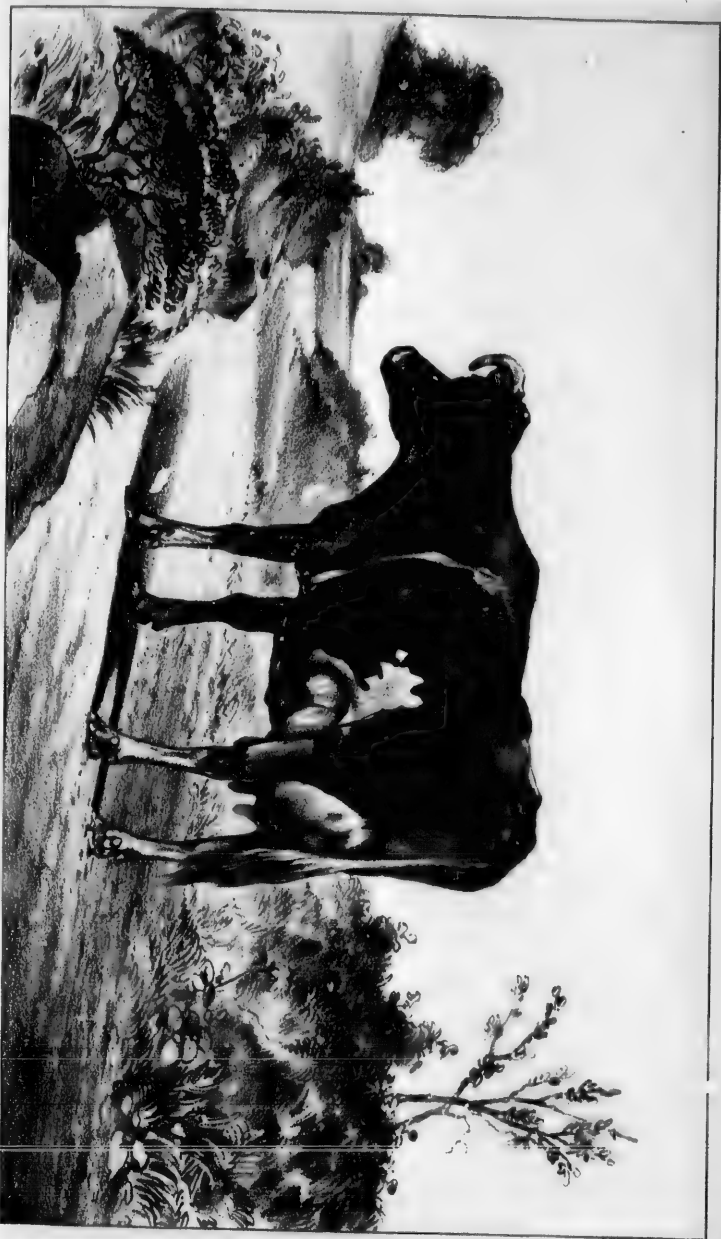
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JERSEY COW "COMMASSIE"

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JERSEY COW "COOMASSIE"

Julius Ryan & Co. Lith.

JERSEY COW "LUNA"

Julius Henck & Co. Ltd.



JERSEY COW "LUNA"

Julius Benck & Co. Lith.

MR. J. JAMES' GUERNSEY COW "LADY EMILY FOLEY 2ND"

Julius Bean & Co. Inc.



MR. J. JAMES' GUERNSEY COW "LADY EMILY FOLEY 2nd"

Julius P. Ward & Co. Lith.

MR. J. JAMES' GUERNSEY COW "VALENTINE 3rd"

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MR. J. JAMES' GUERNSEY COW "VALENTINE 3RD"

Julius Bend & Co. Lith.



GUERNSEY BULL

SHOW AT TURKISH

Julius Rosen & Co. Ltd.



GUERNSEY BULL

WOMAN 21. 1877-1880

Julius Beal & Co. Lith.



GUERNSEY COW
SHOWN AT TENDRIST

Julius Brant & Co. Ltd.



Julius Brant & Co. Lith.

GUERNSEY COW

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MR. L.W. LEDYARD'S GUERNSEY COW "ELEGANTE"

Julius H. H. Co. Inc.



MR. L.W. LEDYARD'S GUERNSEY COW "ELEGANTE"

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WURTEMBERG CATTLE LAWS.

In order to put into general practice some system of cattle-breeding which should be universal throughout the kingdom and be governed by the experience of years, the Wurtemberg Government promulgated on the 16th of last June a detailed law providing for the maintenance in each township of a sufficient number of breeding bulls of a race or races adapted to the demands of the locality. This law is so thorough and systematic in its provisions that notwithstanding its length I deem it worth while to incorporate it bodily in my report as a model by which possibly other cattle-breeding communities may be guided.

Law in regard to the keeping of bulls.

[Enacted June 16, 1852.]

ARTICLE I.

Townships shall be obliged to maintain a proper number of bulls for breeding purposes in their respective districts in proportion to the existing number of cattle, and so as is not otherwise provided for. A number of townships or subtownships may associate themselves together for the joint maintenance of the proper number of bulls. This joint action shall be effected by agreement of the citizens through their proper representatives. (Article VIII, section 5 and 6, of the statute of September 17, 1853.) In the subtownships, defined by distinctive boundaries, the keeping of bulls is obligatory upon existing contract. (See Article VII of the statute of September 17, 1853, concerning relations between adjoining townships, Reg. Blatt, page 389.)

ARTICLE II.

Townships may arrange for the keeping of the bulls under their own direction, or under that of a duly appointed bull-keeper. In the latter case a contract must be made for a period not less than six years. The taking charge of the bulls for a shorter period, or by several persons together, or by the individual cattle owners alternately can only be permitted in exceptional cases, subject to revocation by the county authorities upon the advice of the inspecting officers.

ARTICLE III.

Any appeals by the townships against the carrying out of Article I, section 1, by the county authorities, as well as against a refusal by the said county authorities in the case of Article II, section 2, shall be made to the *kreisregierung* (district authorities), whose decision shall be final.

Appeals must be brought within two weeks after the promulgation of a decision by the county authorities.

A delay beyond the period named involves the loss of right to appeal. The same result holds in the right of appeal by the county authorities. No advice will be given in regard to redress.

ARTICLE IV.

To defray the expense incurred by the township for the maintenance of bulls, the township may itself levy a breeding-fee for the use of the bulls, or allow the levying of the same by the bull-keeper appointed under the provisions of Article II.

The consent of the county authorities shall be required to establish or abolish breeding-fees, as well as to increase or diminish the amount of the same.

ARTICLE V.

The breeding-place shall be in the neighborhood of the stalls where the bulls are kept, and shall be closed to the admittance of strangers, or from observation from without. In towns not complying with this direction the covering of cows will not be authorized.

ARTICLE VI.

Only bulls for which a permit has been issued shall be kept either by the townships, by the bull-keepers appointed under contract by the townships, or by property-owners. The same restriction applies to those private persons owning bulls which are regularly, either in whole or in part, kept for the covering of others' cows.

Permits shall only be issued for such bulls as have upon examination been adjudged fit for breeding purposes by the inspecting authorities. Township bulls (see section 1) shall, moreover, be adapted to the breed of stock dominating in the township.

ARTICLE VII.

Permits are valid until the next regular inspection (Article X), and anywhere throughout the kingdom. They may be revoked by the inspectors of the district in which the bull belongs, in case the bull proves unfit for breeding purposes.

ARTICLE VIII.

The board of inspection competent for the issue or revocation of such permits shall consist of three regular members and an equal number of substitutes, who serve in case of the personal interest, or other hindrance of regular members. The same are to be appointed by county districts for a term of three years at the official meetings and simultaneously with the appointment of the presiding officer and his substitute. In districts in which, under the provision of the statute for organizing agricultural associations, dated April 12, 1877 (Regierungs Blatt, page 43), a regularly organized district association exists, the election of members of the board of inspection, with the exception of the presiding officer and his substitute, is to be left to the committee of the association.

A resolution of the board of inspectors (with the exception pointed out in Article II, section 1) is only valid when adopted in full session.

ARTICLE IX.

Members of the board of inspectors may on application to the county authorities resign their office before the expiration of the time for which they are appointed. They may be involuntarily dismissed from office by order of the county authorities on a decree from the ministry of the interior when based on good grounds.

ARTICLE X.

The board of inspection shall annually, on a day to be fixed by the presiding officer in conjunction with the royal county authorities, make a regular inspection of the bulls in each township, with a view to determining the question of the issue of permits. At the same time inquiry shall be made as to whether the provisions of Articles I, II, and IV are complied with.

The result of their inspection, especially in relation to any irregularities discovered, shall be reported to the county authorities.

Special meetings of the board of inspection may be called by the county authorities in cases when, after the issue of a permit for a bull, and previous to the next regular inspection, such facts may come to the county authorities' knowledge as seem to render necessary a revocation of the permit. Likewise, in other cases of emergency, the board of inspection, or an individual member thereof, may be charged by the county authorities with the duty of making an inquiry into the condition of the bulls in a township.

ARTICLE XI.

Applications for the issue of a permit after the making of the regular inspection shall be decided upon by the presiding officer of the board of inspection, or some other member acting under his authority.

In case the application is not made by a township official the applicant must, prior to the inspection being made, deposit the amount of the costs arising therefrom with the chief magistrate of the village.

ARTICLE XII.

Appeals against a refusal or revocation of a permit may be made to the superior board of inspection by a member of the common council, so far as it pertains to the case of a township bull or by the bull-keeper. (Article III.)

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Such appeals must be brought within two weeks after the promulgation of the county authorities' decision, either verbally dictated in protocol form or in writing. In such case the provisions of Article III, section 3, are equally applicable. Unless the appeal is made by the common council the appellant must at once, or within a time to be named by the county authorities, deposit a sum adequate to defray the costs arising from the appeal. In case this deposit is not made, or if the appeal appears to be untenable, it may be dismissed by the county authorities, otherwise it is to be handed over to the presiding officer of the superior board of inspection.

ARTICLE XIII.

For deciding upon appeals against the refusal or revocation of a permit a superior board of inspection holding office for a space of three years shall be appointed in each agricultural association district.

Said board shall consist of three regular members and an equal number of substitutes, who serve in case of the personal interest or other hindrance of regular members.

The presiding officer and other members as well as the substitutes shall be appointed by the Centralstelle for Agriculture upon the recommendation of the respective committees of the agricultural associations.

The provisions of Article IX govern the action of the members of the superior board of inspection with the understanding that the Centralstelle for Agriculture acts in the place of the county authorities.

The superior board of inspection must furnish grounds for any resolution adopted by it in full session. Its resolutions are final. No fees are to be charged.

ARTICLE XIV.

Any further provisions in regard to the organization of the boards of inspection and superior boards of inspection, the indemnification of their members and the conduct of their proceedings shall be promulgated through the ministry of the interior.

ARTICLE XV.

In the case of Article X, section 3, he who may have brought about a special inspection without just cause, shall bear the costs incurred.

The costs of a special inspection as provided for in Article XI fall to the charge of him who proposed it, and the costs of a rejected appeal (Article XII) to the charge of the appellant.

All other costs arising out of the action of the boards of inspection and the superior boards of inspection are to be borne by the corporation in whose district the bulls are.

The county authorities shall act in first instance for the imposition of the costs.

ARTICLE XVI.

Violations of the provisions of Article V and Article VI, sections 1 and 2, shall be punished with a fine not exceeding 100 marks. The fines go to the treasury of the corporation.

Articles IX—XXV of the law of the 12th of August, 1879, in relation to the amendment of the rural police law of December 27, 1871, and the proceedings relative to the imposition of fines by the police, are here equally applicable.

ARTICLE XVII.

The provisions of the present law shall take effect on the 1st of May, 1883, with the exception of Article VI, sections 1 and 2, which shall not go into operation until the 1st of January, 1884.

Our ministry of the interior is charged with the execution of this law.

DECREE FOR THE CARRYING OUT OF THE FOREGOING LAW.

[The following decree, though extremely detailed in its interpretation of the law to which it relates and upon which it is based, contains, nevertheless, many points of interest to stock-breeders, and is therefore herewith appended.—Note by Consul Catlin.]

Decree of the ministry of the interior providing for the carrying out of the law of June 16, 1882, in regard to bull-keeping.

[October 31, 1882.]

For the carrying out of the law of June 16 of this year in regard to bull-keeping (Reg. Blatt, page 205), it is with the approval of His Majesty the King decreed as follows, namely:

ARTICLE I.

1. Townships shall take charge of the bull-keeping, in so far as the necessity for it there exists; especially in so far as cattle-owners in the township are not in a position themselves to keep the bulls requisite for their cattle; and in case where the keeping of bulls in some other manner, viz, by contracts with a third party, is not already provided for. If by contracts with a third party or by other arrangement the actual requirement is only supplied in part, or in the event that those who hold contracts do not fulfill their duty, the township shall, according to the requirement, supply the demand.

If in a township some cattle-owners keep their own bulls for their cattle and allow other cattle-owners the covering of their cows by such bulls under the condition that the latter serving for the use of others' cattle be supplied with permits, and that they be adapted to the breed of cattle in the township, then bull-keeping by the township can be dispensed with so long as no necessity for it exists and no inconvenience results therefrom. If through existing contracts with third parties only a part of the requisite number of bulls is kept and yet the bull-keeping be in general in charge of the township, then in order to avoid inconveniences resulting from such conditions, relief is to be sought through the said existing contracts with third parties.

In adjacent townships, consisting of a greater number of subtownships, as well as in isolated townships, a joint system of bull-keeping corresponding with the local requirements and on a proper arrangement between the subtownships is to be aimed at. It is hereby made known that the law permits associations of subtownships with various townships, and of subtownships with single townships, and that it is also permitted to such associations to keep bulls, if only for a single breed of cattle. An approval after inspection by the police is not necessary for associations of this kind.

2. As to number and breed of bulls to be kept the following rules are to be observed: To every 80 cows and full-grown calves at least 1 bull should be kept. But if there be in one township 400 or more cows and full-grown calves, then 100 cows and full-grown calves may be reckoned to 1 bull, if the bulls are together and kept by one and the same person.

The breed of the bulls must correspond with that of the cattle in the township, or must be such as can be advantageously crossed for the raising of good cattle.

The township is not obliged to keep special bulls for cattle of an exceptional race. But should there be more races in the township not suitable for crossing (article 6, section 3, of the law), then for each of these single races special bulls are to be kept. A race is to be considered sufficiently numerous if there be 40 cows and full-grown calves.

In reckoning the number of bulls to be kept by the township only those female cattle are counted for the covering of which the bulls are to be kept. There remain to be counted separately those female cattle for the covering of which the owners keep their own bulls; and again, if bulls of different races are to be kept, for example, for 150 cows, of which 100 belong to one and 50 to another race not suitable for covering, 3 bulls are to be kept, while for 150 female animals of one and the same race 2 bulls suffice. If on account of the condition of the bulls or from some other cause the proportion in number be not sufficient, then the township shall keep more bulls according to the requirements of the case.

ARTICLE 2.

3. The management of bull-keeping by the township is everywhere recommended where local conditions permit. But if the bull-keeping is not in the charge of the township, it is desirable that the bulls should be bought by the township and remain their property.

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large of the township,
remain their property.

If a bull-keeper is charged with the bull-keeping by contract, then, in the first place, in charging him, it is to be seen if his capacity can be trusted—if he have proper stalls and a place for exercising the animals, according to article 5 of the law, and if he has or buys sufficient food of a proper quality. Care should be taken not to award this position to the highest bidder; but should proposals be received, it must be with the condition that the township have the choice among the applicants, and the position is only then to be awarded to that one who will serve for the least wages, provided there is certain ground for believing that the bulls will be well cared for by him. In the township minutes it is to be recorded that no doubt exists on this point.

4. The post of bull-keeper under the provisions of the law is not to be awarded for less than six years, but as a rule should be awarded for a longer time, so that the bull-keeper may be in a position to make the necessary outlays for the proper fulfillment of his contract. The township has, however, the right to release the bull-keeper from his contract before its expiration if any failure in the fulfillment of his duty can be shown. The bull-keeper's wages must be so fixed as to give him a proper remuneration for his time, trouble, and expense.

5. Under the exceptions of the law contained in article 2, section 2, townships are to observe the following principles:

The awarding of the post of bull-keeper for a shorter period than six years is only to be permitted where exceptional local or personal conditions render a six-year contract impracticable. Its awarding to several persons at once may only take place under certain local conditions, as, for example, if the farms belonging to the township be located far apart, and then only if there is no risk of a disadvantageous rivalry between the bull-keepers on the too frequent use of a single bull.

If bulls of different breeds are kept, then, in exceptional cases, where no doubt exists, a special keeper may be allowed for the bulls of each individual race.

The alternate awarding of the post of bull-keeper to individual cattle-owners may only be permitted in those townships which consist of scattered farms, and then only in cases where it is shown that those cattle-owners among whom the bull-keeping is to alternate are capable of fulfilling their duties in a proper manner.

The foregoing exceptions are based upon the condition that the rule in article 5 in reference to location and kind of places for exercise are complied with. Moreover, exceptions of this kind are only to be permitted for a stated period.

ARTICLE 3.

6. It is the inspector's duty in the regular inspection of bulls, as well as by special request of county authorities, to examine whether the townships fulfill their duty in reference to bull-keeping and to give their opinion to the said authorities. They are also by joint counsel with the county authorities and bull-keepers to aim at improvements and as much as possible prevent irregularities.

The county authorities in carrying out the law (according to articles 1 and 2, and in fulfillment of the above rules) are to hear the opinion of the inspectors and as far as possible to commission the board of inspectors or a member of the same with the investigation of the bull-keeping in any given township; also to provide a check through another member of the board of inspectors to see that the commission is properly executed. If the county authorities have doubts on the opinion of the board of inspectors, they are to address themselves to an overinspector for an inquiry, submitting a statement of the facts in the case.

Where the district authorities are called on to decide upon an appeal, it is left to their choice to ask the decision of the inspector or overinspector, or, if required, the central stalle for agriculture.

ARTICLE 4.

7. The increase of fees for the use of bulls is to be allowed in townships where (a) cattle-owning is distributed very unevenly among the population; (b) a loss to the township is occasioned or increased through bull-keeping, and has thereby to be borne by tax-payers who derive no immediate profit from it, as, for instance, trades-people or land-owners owning cattle in the township, or those who keep their own bulls, or where (c) on account of there being several breeds of cattle more bulls have to be kept than if there were only cows of one and the same race. In such townships a proper fee is to be charged, and the increase or decrease of the same only to be allowed by the county authorities when there is no unjust burden occasioned to some tax-payers to the benefit of others.

Such increase or decrease of fees in townships which sustain no loss and do not incur any loss thereby will not as a rule be objected to.

ARTICLE 5.

8. It is to be observed that the provision of article 5 with regard to locality and character of places for covering and the prohibition against covering in a place not corresponding to these regulations, not only refer to the employment of township bulls but also to bulls of private parties, whether they be used for covering their own or others' cattle.

ARTICLE 6.

9. The provisions of article 6 are not applicable to bulls kept on Government or royal farms.

According to the provisions of article 6, sections 1 and 2 (also article 16), in future the use of bulls without a permit is allowed only so far as they are kept by private persons exclusively for the covering of their own cattle. Although the exceptional use of a bull without a permit for the covering of others' cattle is not punishable, yet the police authorities are to see that the provisions of the law are not thereby evaded; and special attention is directed to the circumstance that a frequent or regular use of private bulls without a permit is punishable, even if no fee be paid.

Permits can only be withheld for the reasons mentioned in article 6, section 3.

"Township bulls" in the meaning of the law are to be considered as not only those mentioned in article 6, section 1, but also those which are kept under contract by third parties for breeding purposes in the district.

ARTICLE 7.

10. In case of any change in the ownership of a bull the right granted by the permit passes over to the new owner. In such case the permit may be transferred by means of an indorsement upon it from the president of the board of inspection which issued it, provided that the identity of the bull transferred is established. Such transfer is to be entered in the minutes of the board of inspection. (Section 18.)

11. If there come to the knowledge of the authorities facts indicating the unfitness of a bull for breeding purposes, and a consequent necessity for the withdrawal of the permit, the bull owner is in the first place, in consideration of article 7, section 2, of the law and of the costs arising from the appeal, to be requested to give up the permit.

If this summons is not complied with, the board, which can only in full meeting order the withdrawal of the permit, is to be assembled.

The county authorities are to inform the board of inspection which issued it of the withdrawal or voluntary return of a permit in order that the necessary note may be made by them in the minutes (section 18). (See further section 21, sections 1 and 3.)

If a township bull, even though not unfit for breeding purposes, yet proves not adapted to the breed prevailing in the township, the county authorities shall require the removal of this bull from the township, but no withdrawal of the permit in such case is legal.

ARTICLES 8-11.

12. The election of the board of inspection is to take place in such manner that the ordinary members, the substitutes, the president, and the vice-president are chosen by separate ballots. An ordinary member may be elected as vice-president pro tem. In this case every time such member acts as vice-president a substitute is to fill his place in the meetings.

Substitutes are not elected as such for any particular regular member, but for any regular member. Therefore, the president may choose as to which one of the substitutes he wishes to call in in individual cases.

Wherever no special reasons exist to the contrary, that substitute is to be called upon whose substitution involves the least expense.

13. In order to avoid delay in the election of the board of inspection, the county authorities are to summon the committee of the agricultural district association at least four weeks before the meeting, at which the president and his substitute, and eventually all the members of the board of inspection, are to be elected. (According to article 8, section 3.)

It is left to their judgment so to provide that the meeting appoint the president or vice-president, or both of them, from those elected by the committee of the agricultural district union, and to elect at the same time in their stead one more regular member and one more substitute.

If no doubt exists that the committee of the agricultural district union intend to avail themselves of their right of voting, the meeting may go through the election of president

and vice-president already before the election of the other members on the part of the said committee.

If an agricultural district association does not either at all or within the prescribed time avail itself of its right of voting, the meeting is to elect all the members of the board of inspection, and any subsequent voting by the agricultural district association is in such case invalid.

11. The term of office of members of the board of inspection begins May 1 of the first year and ends April 30 of the last of the three years for which they are chosen.

Members of the board of inspection apply for discharge before the expiration of their term of office, it is to be granted them by the county authorities, after provisions have been made for the necessary substitution and eventual filling of the vacancy in the board of inspection; until discharged, members are to attend to their official duties.

If members of the board of inspection withdraw before the expiration of the period for which they are chosen, a supplementary election for the remainder of that period is to be held. Such election may be omitted, if no necessity exists for the filling of the board.

15. The composition of the Board of Inspection, as well as changes therein, are to be promulgated by the county authorities through the official paper of the district and reported to the superior board of inspection and to the Centralstelle for agriculture.

The president and vice-president, as well as the other members residing at the county seat, are to be sworn by the county authorities and members residing outside the county seat, by order of the county authorities, through the mayor of their place of residence. The following oath is to be used:

"I swear by the Almighty and Omniscient God, that I as a member of the board of inspection will attend impartially and to the best of my knowledge and conscience to the discharge of the duties of the office conferred upon me. So help me, God."

Members of the board of inspection who in the same capacity have already been previously sworn are to be reminded of the oath already made by them.

16. The following persons are on account of personal interest prohibited from participation in the resolutions or decisions of the board of inspection: (1) The owner and any one who during the last two years has been owner of the bull to be inspected; any one else having a substantial interest in the decision of the board of inspection, or any one interested in the use of the bull under inspection, or wherever a township bull is concerned any one contributing to the expenditure of the township for bull-keeping through township taxes. (2) The husband or wife of such parties as are mentioned in articles 1 and 2, even if their state of matrimony no longer exists. (3) Those who are related in direct line, by marriage or by adoption, or related in a collateral line up to the third degree or by marriage up to the second degree to the proprietor of the bull under inspection, even if the state matrimony on which the relationship is based no longer exists.

When the board is assembled it shall decide (otherwise the president) whether any such case of hindrance exists.

17. The board of inspection enters upon its duties upon the call of the county authorities.

The president, or in his absence the vice-president, is required after receipt of the summons to name a date for the assembling of the board of inspection, as well as place and time for the bull inspection, and to summon in season for that purpose the two regular members.

If a summoned member is prevented from taking part on account of personal interest or other cause, he is at once to inform the president of the fact in order that the call of a substitute, and if necessary the putting off of the date, may be made in season.

In case the president is previously aware that a member is prevented from participating he may at once summon a substitute.

Members of the board of inspection who prevent the inspection taking place through unexcused absence or the tardy notice of their inability to attend are responsible to the township corporation for the costs incurred on their account.

The mayor of the township concerned is to be informed in season of the date fixed for a regular bull inspection, or for an investigation of the bull-keeping in the township, or of a special inspection of a township bull, together with the request to be present at the inspection or to delegate thereto a deputy in order to obtain proper information in regard to the circumstance of the case.

18. To render valid a decision of the board of inspection the co-operation of the president or vice-president and of two other members of the board of inspection is necessary with the exception named in Article XI of the law.

The board of inspection decides by a majority of votes, and as a rule immediately after the inspection of the bull at the place.

The decision of the board of inspection (in the case of section 22, also those of any of its members) are to be entered on a current minute-book to be kept according to

the blank form provided in Appendix A (see Inclosure V). The record may be made either by the president or another member of the board named by him.

In case the board decides upon granting a permit, such permit is as a rule to be made out at once according to the blank form provided in Appendix B (see Inclosure V), to be certified to by the seal of the board of inspection and the signature of the president, and to be handed to the claimant.

If the withholding of the permit is decided upon, the grounds therefor are verbally stated to the bull-owner and briefly to be noted in the minutes.

In exceptional cases the transmittal of the permit or the communication of the refusal may take place through the medium of the mayor.

If a permit had been previously issued for the inspected bull, such permit must be delivered up to the board and by it destroyed.

19. If no farther be a member of the board it may, where for special reasons the decision as to the granting of a permit depends upon the result of a veterinary examination of the bull, propose to the county authorities the holding of such examination and the reporting of the result. The decision of the board is, however, in such cases to be so rendered that it can be acted upon on communication of the result of the examination without another inspection of the bull, thereby causing further expenses, and without further oral consultation of the board.

20. The committee of the Agricultural District Association and the township meeting are to be summoned by the county authorities to express their opinions as to the time at which the regular annual bull inspection shall be held. Upon such opinions the President of the Board, with the consent of the county authorities, shall fix the date for the bull inspection in the different townships with all possible regard to the saving of expense.

In making the regular bull inspection the board is at the same time to make inquiry in the different townships as to whether the bull-keeping is in compliance with the prescriptions of articles 1, 2, and 5 of the law, and of sections 1, 5, and 8 of the present decree. The result of this inquiry is to be entered in a special current record of visits made, which record is to state:

- (1) The number, race, age, and quality of the township bull (section 9, last section, and in the cases of section 1, section 2, of the bulls mentioned therein.
- (2) The number and race of the cows and full-grown calves in the township district, whereby if there are different races the number of animals belonging to each race, is to be stated separately, deducting those (the number of which is to be stated) for the covering of which the owners keep special bulls of their own. These figures are to be placed at the disposal of the board by the mayor.
- (3) Method of bull-keeping, i. e., whether under the township's own management, or through appointed bull-keepers, or with or without the purchase of the bulls at the expense of the township, or through third parties under contract for bull-keeping, &c.
- (4) Nature of the stalls where the bulls are kept.
- (5) Nature of the place for covering.
- (6) Maintenance of the bulls.
- (7) Irregularities discovered.
- (8) Suggestions by the board.

After the termination of the regular bull inspection this record of visits made, with the suggestions offered, is, with the minutes of the inspection, to be submitted to the county authorities for their perusal, and afterward to be returned by the latter to the president of the board of inspection.

21. The granting and withdrawing of permits, as well as the giving up of the same, is to be communicated to the mayor, and to be promulgated by him in the usual manner.

It is left to the judgment of the county authorities as to publishing a statement of the result of the regular bull inspection through the official paper of the district.

If the withdrawal of a permit is legally ordered it is to be reclaimed and destroyed by the president of the board of inspection, if necessary through the medium of the mayor.

To replace a lost permit another may be made out by the president of the board of inspection, based on the bull-inspection minutes. Such claim is to be complied with where there exists no reason for suspecting any fraud.

22. Proposals for granting a permit after the regular bull inspection are to be registered at the mayor's. At the same time, unless the proposal comes from a township authority, an amount is to be deposited with him, which is likely to cover the expenses arising from an examination of the bull at the place where it is kept.

The mayor is to inform the county authorities of the proposal when made, stating the amount deposited.

If the requirement to deposit a sufficient amount for costs be not fulfilled, the proposal is to be refused by a resolution of the county authorities.

In case a sufficient amount for costs is advanced, or if the proposal comes from a township official, the county authorities are to require the president of the board of inspection to bring about a decision with regard to it.

It is left to the president whether he himself will decide on the proposal or whether he will charge another member of the board of inspection with doing so. In this matter he is to consider all possible saving in traveling expenses.

As rules for procedure in other regards the provisions of sections 16 to 19 and 21 are applicable, with the modification that as a rule only one member of the board of inspection makes and decides upon the examination of the bull.

The examination of the bull can be made at the place of residence of the deciding member, if the owner of the bull takes him thither for that purpose.

In exceptional cases a permit may be granted without previous examination of the bull at the place where it is kept, provided the deciding member of the board of inspection is thoroughly informed concerning the bull, in consequence of an inspection held a short time previously, as, for instance, at a recent award of premiums.

The county authorities are to be informed of the decision taken upon any proposal, with a statement of the bill of costs.

23. Upon the special request of a bull-owner the full board of inspection may decide upon a proposal for a permit after the regular bull inspection, if the applicant is willing to bear the cost arising therefrom.

It is left to the judgment of the county authorities, after consultation with the committee of the agricultural district association, to allow, so far as it is necessary, special bull inspections to be held in certain townships by the whole board of inspection if either the cattle-owners concerned or the townships, or, by vote of the township meeting, the township corporation are willing to defray the expenses.

ARTICLE 13.

24. The appointment of the superior board of inspection is, as a rule, to precede the election of the members of the boards of inspection in the district of the circuit association of the agricultural district association, to allow, so far as it is necessary, special bull inspections to be held in certain townships by the whole board of inspection if either the cattle-owners concerned or the townships, or, by vote of the township meeting, the township corporation are willing to defray the expenses. Accordingly the centralstelle for agriculture is in due season to call upon the circuit committees of the agricultural association to propose nine experts residing in their respective districts for appointment as members of the superior board of inspection.

The composition of the superior board of inspection is to be promulgated through the official papers of the districts concerned.

The members of the superior boards of inspection are by direction of the centralstelle for agriculture to be sworn by the county authorities of their place of residence, using the oath given in section 15. Members of the superior board of inspection, who in such capacity have been already previously sworn, are to be reminded of the oath already made by them.

The provisions of section 14 are properly applicable to members of the superior board of inspection (see, however, article 13, section 4, of the law).

25. If a complaint is transmitted in the prescribed form (article 12 of this law), the county authorities are, in cases where proofs are subjoined, in the first place, to cause the board of inspection to report promptly upon the complaint, and then to send it with such report to the president of the superior board of inspection for further action, stating the amount of costs deposited.

The corresponding provisions of sections 16 to 19 are properly applicable to the proceedings of the superior board of inspection, with the following modifications:

(1) Participation in a resolution or opinion of the superior board of inspection is prohibited to those members who are at the same time members of the board of inspection from which the contested decision comes, or who have participated as former members in the said contested decision.

(2) If the permit is granted in second instance it is to be enforced at once and handed to the claimant, and the county authorities are to be informed of it for the purpose of taking further steps with regard to the costs. But if the complaint is rejected, then—without prejudice to its immediate communication to the claimant—a resolution comprising a brief explanation is to be drawn up and sent to the county authorities to whom the complaint was addressed. The county authorities on their part are to fix the costs to be borne by the complainant, and then to cause the resolution of the superior board of inspection, together with their decision concerning the costs, to be handed to the complainant through the mayor.

26. The members of the boards of inspection and superior boards of inspection are to receive for performing their functions outside the township district of their place of residence 5 marks allowance for an entire day, and a proportional sum for a shorter time,

according to section 10 of the royal decree of February 22, 1841 (Reg. Blatt., page 83), besides the defraying of their traveling expenses according to section 4 of the royal decree of June 14, 1875 (Reg. Blatt., page 314), and in case of their remaining abroad over night, for every night of such absence a reimbursement of 2 marks.

It is reserved to the judgment of the township meetings with the consent of the district government, their superiors, to increase in a proper way the allowances and traveling expenses of the members of the board of inspection in consideration of the special conditions of the district concerned, or to fix certain contributions for them. In the latter case, however, it is left to the individual members of the board of inspection to require, through a declaration to be given covering the whole period of their term of office, that instead of such fixed contributions, the allowances and traveling expenses, according to the provisions of the first section, may each time be granted them.

Farriers, when serving as members, receive, unless by contract some other provisions are agreed upon, the usual allowances and traveling expenses of county farriers according to the existing regulations (decree of the ministry of January 16, 1874, Reg. Blatt., page 83).

The bills for allowances and traveling expenses of members are to be transmitted through the president to the county authorities for auditing and payment from the township corporation funds or out of the moneys deposited in advance.

The cost of blank forms for permits and minutes and of other writing materials, postage, &c., required for the boards of inspection and superior boards of inspection, are likewise to be defrayed through the county authorities and out of the township corporation funds.

27. The township authorities are, even before this law takes effect, to provide that contracts for bull-keeping, not made out in compliance with the provisions of the law and this accompanying decree, be made to do so as soon as possible. New contracts not corresponding with these provisions, and the period of which extends beyond the 1st of May, 1883, are not allowed to remain in force.

The county authorities are to assure themselves that bull-keeping, after the promulgation of this law, is carried on strictly according to its provisions and those of this accompanying decree. At the same time, however, during the period of transition, so far as practicable, and especially in the case of poor townships, regard is to be had as much as possible to local conditions and to the difficulties encountered in changing the existing order of things. Whenever in such cases a departure from compulsory provisions seems necessary, applications are to be addressed to the ministry of the interior.

STUTTGART, October 31, 1882.

The re
ary, 1882
parison,

Upper Bavaria
Lower Bavaria
Upper Palatinate
Upper Franconia
Middle Franconia
Lower Franconia
Swabia.....
Total.....

Upper Bavaria
Lower Bavaria
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Swabia.....
Total.....

H. E.

DOMESTIC ANIMALS IN BAVARIA.

[Report by Consul Harper, of Munich.]

The results of the general counting of cattle stock in Bavaria on the 10th day of January, 1883, are given in the following tables, to which is added, for the purpose of comparison, the results of the counting on the 10th day of January, 1873:

	Year.	Total number of—				
		Horses.	Neat cattle.	Sheep.	Hogs.	Goats.
<i>Cities and towns.</i>						
Upper Bavaria	1883	7,240				
	1873	6,845	7,060	2,811		
Lower Bavaria	1883	2,055	6,829	4,065	4,527	517
	1873	1,719	3,466	176	4,091	422
Upper Palatinate	1883	1,040	3,028	242	2,449	167
	1873	1,016	1,742	86	2,636	144
Upper Franconia	1883	1,758	1,559	101	1,500	437
	1873	1,507	3,223	430	1,023	357
Middle Franconia	1883	4,550	5,983	523	1,023	807
	1873	3,760	5,083	3,939	1,161	643
Lower Franconia	1883	2,088	5,750	4,874	4,873	1,000
	1873	1,851	2,528	1,648	3,837	1,700
Suabia	1883	4,788	2,432	1,535	1,798	1,162
	1873	3,934	6,928	9,818	1,591	819
			6,733	12,877	3,385	587
Total	1883	23,519	30,932	18,908		
	1873	20,632	29,798	24,217	19,555	5,907
					18,147	4,652
<i>County districts.</i>						
Upper Bavaria	1883	104,110				
	1873	104,374	608,314	244,980		
Lower Bavaria	1883	31,086	618,836	240,394	137,123	11,787
	1873	72,208	518,161	154,869	164,591	12,273
Palatinate	1883	33,869	600,783	202,262	191,194	15,498
	1873	34,064	217,699	37,469	152,856	17,400
Upper Palatinate	1883	16,013	344,509	33,957	72,535	39,724
	1873	15,334	344,509	112,814	56,922	34,562
Upper Franconia	1883	6,450	345,701	129,618	131,599	15,955
	1873	6,201	259,244	129,618	123,685	14,164
Middle Franconia	1883	6,201	273,552	78,027	76,343	39,459
	1873	25,284	294,505	105,115	68,910	34,224
Lower Franconia	1883	16,765	291,847	219,236	189,879	34,532
	1873	17,411	289,913	114,962	120,450	31,155
Suabia	1883	54,992	294,575	150,588	169,652	48,550
	1873	55,454	461,619	175,396	145,296	37,981
			478,325	186,813	103,453	8,172
Total	1883	338,560	2,963,904	1,159,286		
	1873	340,235	3,036,483	1,317,973	1,071,778	213,677
					853,951	189,229

RECAPITULATION.

Upper Bavaria	1883	111,350	615,371			
	1873	111,219	625,665	247,791	141,650	12,304
Lower Bavaria	1883	83,141	521,027	294,459	168,595	12,695
	1873	73,987	512,811	154,985	193,643	15,665
Palatinate	1883	33,869	217,699	202,504	155,192	17,544
	1873	34,064	221,834	37,469	72,535	39,724
Upper Palatinate	1883	15,334	344,509	112,814	56,922	34,562
	1873	15,334	345,701	129,618	131,599	15,955
Upper Franconia	1883	6,450	259,244	78,027	76,343	14,164
	1873	6,201	273,552	105,115	68,910	39,459
Middle Franconia	1883	25,284	294,505	211,889	189,879	34,224
	1873	24,489	291,847	219,236	120,450	31,552
Lower Franconia	1883	17,411	289,913	114,962	169,652	31,155
	1873	54,992	294,575	150,588	145,296	48,550
Suabia	1883	55,454	461,619	175,396	103,453	37,981
	1873		478,325	186,813	81,328	8,172
Total	1883	362,088	3,024,926	1,178,194	1,001,333	219,584
	1873	359,867	3,066,251	1,342,190	872,098	193,881

A glance at this table shows that the number of neat cattle decreased somewhat; the number of sheep considerably; the number of horses has increased a trifle; the number of goats has also increased, and the increase in the number of hogs is an important one.

The following table shows the relative comparison of the extent and character of the change in numbers of stock, and the per cental increase and decrease in 1883 as against 1873:

	Horses.	Neat cattle.	Sheep.	Hogs.	Goats.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Upper Bavaria.....	+ 0.1	-1.6	-13	+30	-8
Lower Bavaria.....	+12.4	+1.7	-23	+25	-11
Palatinate.....	- 0.6	-1.9	+10	+27	+15
Upper Palatinate.....	+ 0.6	-0.3	-13	+ 6	+13
Middle Franconia.....	+ 6.5	-5.9	-25	+14	+16
Lower Franconia.....	+ 5.6	+1.0	- 4	+37	+11
Swabia.....	- 2.8	-1.5	- 4	-17	+28
Kingdom.....	+ 0.5	-3.4	- 7	-27	+10
	+ 3.2	-1.3	-12	+25	+13

This comparison shows that horses decreased only in Lower Franconia 2.3 per cent., and in the Palatinate one-half of 1 per cent., whereas the number increased in the districts of Upper Bavaria, Upper Palatinate, and Swabia from one-tenth to one-half of 1 per cent., and in Middle Franconia and Upper Franconia $5\frac{1}{2}$ to $6\frac{1}{2}$ per cent. The increase in the whole Kingdom amounted to 3 per cent.

The number of neat cattle increased in Lower Bavaria 1 per cent., and in Middle Franconia 1 per cent., whereas there was a moderate decrease in the other districts, amounting in Swabia to over 3 per cent., and in Upper Franconia to nearly 6 per cent. In the whole Kingdom the decrease was a little over 1 per cent.

Sheep have decreased everywhere except in the Palatinate, where the increase was 10 per cent. The decrease in Upper Franconia and Lower Bavaria was 25 per cent., in Upper Bavaria 13 per cent., in Upper Palatinate 13 per cent., and in the other districts from 4 per cent. to 7 per cent. In the whole Kingdom the decrease reached 12 per cent.

The increase in the number of hogs is large in all the districts, amounting in Middle Franconia to 57 per cent., in Upper Bavaria, Palatinate, Swabia, and Lower Bavaria, 25 to 30 per cent.; in Upper Franconia and Lower Franconia, 14 to 17 per cent.; Upper Palatinate, 6 per cent. In the whole Kingdom the increase was 25 per cent.

The number of goats was augmented in all the districts except Upper Bavaria and Lower Bavaria, where the decrease was 3 per cent. and 4 per cent. The increase in Lower Franconia was 28 per cent., and in the other districts from 10 per cent. to 16 per cent. The increase for the whole Kingdom amounted to 13 per cent.

The decrease in neat cattle has been more than compensated by the improvement of stock in breed, size, and value, and the farmers prefer to keep fewer and better stock.

The decrease in sheep is partly owing to the low price of wool, the changing of pasture into arable land, and similar causes.

The rapid increase in hogs is due to a larger consumption and high prices.

The increase in goats may be attributed to the fact that marriage and the establishment of a household is now more easy, and the working people keep one or more goats for milk, as it is not necessary for them to possess land for their nourishment.

Population of the Kingdom of Bavaria, about 5,000,000.

JOSEPH W. HARPER, Consul.

UNITED STATES CONSULATE,
Munich, May 12, 1883.

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SHEEP AND PIGS IN THE UNITED KINGDOM.

REPORT BY CONSUL-GENERAL MERRITT.

Supplement to my report on cattle-breeding, I beg to transmit the following notes on the different breeds of sheep and pigs of this country.

BREEDS OF SHEEP.

With the exception of the mountain and British sheep have changed during the past century even more than British cattle. In reviewing the several breeds as they exist at the present time I will commence with

The Cotswold.—This breed may be described as possessing the following characteristics:

"The frames are large, when fattened are surprisingly wide and flat on the back. The hind quarter and thighs are full, and the rumps frequently overhang. The chests are very prominent and wide. The face is white, and the countenance fine. They carry a heavy fleece of beautifully curled white wool, long in staple, and of a lustrous character, used for "combing," and generally for the same purposes as that of the Oxford. They are excellent for crossing with other kinds."

The Cotswold breed can no doubt make good its claim to antiquity far better than most other breeds, and it is generally thought that the Cotswold range of hills owes its name to the sheep cotes once to be found on them. These sheep have finer forms than any other variety in the Kingdom, being very long and broad over the back and shoulders, while their height makes them appear more imposing than they would otherwise be the case. Cotswolds have been so much improved in symmetry and in disposition to fatten during the present century that there is a general opinion that some infusion of Leicester blood took place in Bakewell's day or soon after. Hoggets, under liberal management, feed to carcasses of from 90 to 100 pounds when from eleven to twelve months old. Draft ewes are sometimes fed to great weights, and Mr. John Coleman has stated that he has known instances of their reaching 70 pounds per quarter dead weight. The wool of a Cotswold flock averages about 9 pounds per fleece; hogget clipping, 14 or 15 pounds. The native home of the breed was the neighborhood of the Cotswold hills in Gloucestershire. Afterwards they extended themselves very much into the neighboring counties, especially Oxfordshire, Worcester, and Hereford, and also into Monmouthshire and South Wales. The modern breed of Oxfordshire Down has now very much supplanted this breed in certain districts, but there are yet excellent ram-breeding flocks in Gloucestershire and Oxfordshire, and also in Norfolk.

In reference to the Cotswold breed the accompanying notes (inclosure No. 1*) have been received from Mr. H. I. Elwes, of Colesborne Park, Cheltenham, Gloucestershire, in which he alludes to the origin of the breed, its characteristics, the climate of the locality, nature of soil, &c. This valuable and hardy breed of sheep, it may be noted, possesses great merits in respect to importation as apart from the value of their meat and wool. The excellence of the cross between Cotswold and Merino sheep is acknowledged. Breeders of the Oxfordshire Down, of the Hampshire Down, and of the Shropshire Down, respectively, claim the favor of importers, and these as well as the Cotswolds, the Suffolk, the Lincoln, and the South Down, have great merits that make a choice between them difficult. The Cotswold claims the long descent of three hundred years. Next to the Lincoln sheep in size the Cotswold bears wool weighing 10 pounds to the fleece; in special instances 24 pounds; and the staple is long, very strong and durable, suitable for fabrics for rough wear.

The cross produced between Merinos and Cotswold sheep is heavier at a year old than is a pure-bred Merino at two years. Experiments made by Sir John Lawes credit the Cotswold breed as making a greater and quicker return for its food than does any other breed which he has compared with them. Lamb rams are used for breeding at eight months old. The Cotswold sheep bears cold successfully in the English climate all the year round. From 500 ewes, the produce of Mr. Elwes's flock is 600 to 650 lambs, counted when weaned. The death rate varies from 2½ to 7 per cent. of the whole flock of ewes and lambs. In commenting on the adaptability of the Cotswold sheep to other districts, Norfolk, South Wales, and other parts, Mr. Elwes states that the breed changes character more or less when removed from its native hills. This may well be a fact, and yet many of the Norfolk Cotswolds have carried away prizes when compet-

*The inclosures referred herein by the consul-general will be found in their regular order immediately after his report.



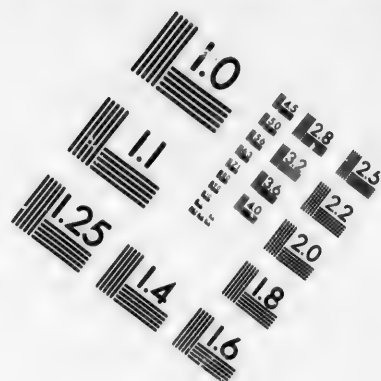
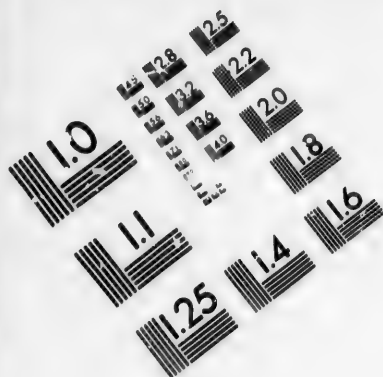
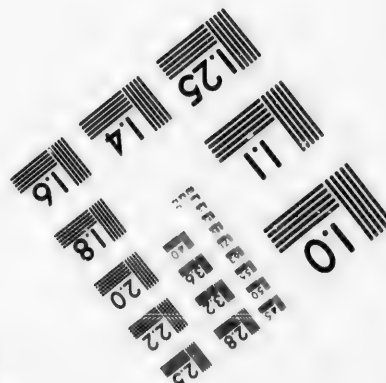
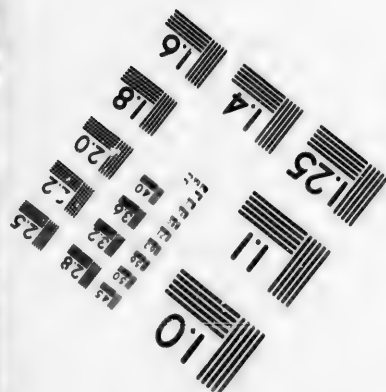
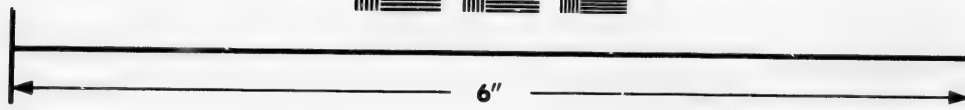
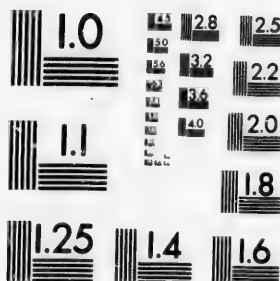


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ing with specimens from Gloucestershire, a result that might, however, happen from the superior grazing qualities of the Norfolk pasture.

The Leicester.—The Leicester breed may be described as follows:

"The head and ears are covered with short white hair. Some are rather bald on the forehead, but this is generally caused by their having been housed. The ears are long and thin; the eyes full and quick; the chest deep and wide; the back broad and straight; the bone fine."

This breed generally takes the foremost position among long-wool varieties. Owing to the magical change wrought by Bakewell in them they became towards the close of the last century the model sheep of England, and the means of transforming well-nigh all the long-wooled breeds in the Kingdom by bringing about better quality and more symmetrical proportions. At the present day really pure-bred Leicesters are somewhat limited, many of the Yorkshire flocks being crosses with the Wensleydale to increase the size and make the flock a better rent-paying one, although the blood is less pure than that to be found in the midland counties. In Scotland and the North of England "Border Leicesters" are in great favor. They are a much less symmetrical and far stronger boned breed than the Leicesters proper, but yield heavier weights, both of mutton and wool, and are far more profitable. Leicesters do not get so weighty as sheep of the Cotswold or Lincoln breed owing to their smallness of bone, nor are they extraordinary wool bearers, 7 to 8 pounds per fleece being a good average. Their wool is not so valuable as formerly now that Australia sends to England the best quality of merino adapted to finer kinds of fabrics. It is, however, the best of the long-stapled, bright, coarse wools, and is used for making the best quality of luster yarns. The weight of wethers from fifteen to eighteen months old is usually from 20 to 22 pounds per quarter.

The Lincolns.—The Lincoln, like the Leicester breed, is an old one very much transformed by modern art. The old Lincolnshire was a gaunt, big-boned animal, capable of feeding to an enormous weight, but taking a long time to accomplish it. By a prodigious infusion of Leicester blood the modern Lincoln has been made pre-eminently wealthy in both mutton and wool, with a predisposition to fatten scarcely excelled by any other long-wooled variety. Lincolns are best adapted to the fens of their native country, and very high class flocks of the breed are likewise to be found in Notts and Yorkshire. The type of Lincoln sheep to be found in the latter country is, however, much crossed with Leicesters. Wether hoggets feed to about 25 pounds per quarter. Being very broad, deep, and compact in form they generally outstrip the Cotswold in weight at the Smithfield Club shows, and last December the heaviest pen* of sheep in the agricultural hall was that of Mr. John Pears, which took the first prize in the ewe class, the animals weighing 9 cwt. 2 quarters 24 pounds. There was, however, a heavier pen of wethers in the Cotswold department than in the Lincoln, Messrs. Gillett's weighing 8 cwt. 6 pounds, whereas the heaviest Lincoln pen of wethers belonging to Mr. Robert Wright weighed 7 cwt. 3 quarters 8 pounds.

As wool bearers Lincoln sheep excel all others. The fleeces average from 12 to 15 pounds for ewes and wethers and 18 to 24 pounds for rams. They have hardy and good constitutions, they thrive on bad clayey soils and where the land is wet. Their hardiness recommends them for increased cultivation. In regard to Lincoln sheep, Mr. Mackinder, of Lincoln, sends a record (inclosure No. 2) of his nine-months old lambs weighing 14 stone, and ewes three years old 26 stone, live weight. The sheep are not housed in winter, and their wool, when washed, weighs 10 to 30 pounds.

The Devon Long-Wool.—This is a breed of long-wooled sheep much valued in Devon and West Somerset. It is the result of a cross of Leicester with an old local breed called the Bampton. The sheep are longer and stand higher on their legs than the Leicesters, in which respect they somewhat resemble Border Leicesters, but are much finer in bone than the latter. The carcasses of wether hoggets when a year old range from 21 to 24 pounds per quarter. The districts where they are found in the greatest perfection are about Tiverton and throughout North Devon generally, also in the Taunton and Willeton vales of Somerset. There are two other long-wooled breeds to be found in Devon, but chiefly in the southern part of that county. These are the South Hams and Dartmoor varieties.

The former are considered excellent rent-payers, and yield fleeces almost as heavy as those of the Lincolns. They likewise feed to tolerably heavy weights, yet are far coarser in bone and less symmetrical than the North Devon. The Dartmoors are giants, and in case of crosses on the old mountain Dartmoor by South Hams rams the fleeces are heavy, but most remarkably coarse and long. The carcasses of the sheep are very weighty, but they are considered to take a long time to fatten. The locality where they are found is around Tavistock or on the slopes of the Dartmoor mountains.

The Kentish or Romney Marsh.—The Kentish or Romney Marsh sheep are gaunt, and very strong in bone, muscle, and wool. The Kent Marshes are very much exposed to

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channel blasts, so that breeders dare not improve them overmuch, but in some parts of Kent the breed is to be met with divested very much of the coarseness so objectionable in the eyes of strangers. The fleece is heavy and long, and possesses fineness of fiber, good luster, and a curl in the staple which gives it the "spring" which is so much prized. Its special feature is its good spinning properties.

It is also used for mixing with mohair. Their flesh is of better quality than that of most other long-wooled sheep, excepting alone the Dartmoor, and when fattened their carcasses weigh from 25 to 30 pounds per quarter. As a proof that they are capable of early maturity, the first prize pen of lambs of Mr. H. Page, of Walmer, weighed 4 cwt. 3 quarters 4 pounds, which far excelled that made by the heaviest pen of Leicester lambs, to wit: 3 cwt. 2 quarters 10 pounds, although the latter were two weeks older.

The Roscommon.—The Roscommon breed is a celebrated long-wool variety in Ireland which new rivals in usefulness most of the English breeds of a similar kind, and as the old Roscommon was peculiarly gaunt, big-boned and unshapely, the transformation, by a plentiful infusion of Leicester blood has been truly marvelous. Shearling wethers are usually fed up to from 25 to 30 pounds per quarter, and draft ewes are sometimes fed up to 40 pounds per quarter. The fleeces of a flock generally average about 8 pounds each. The wool is soft, deep-grown and rich. The breed is not only to be found in the county giving its name, but also in West Meath and Limerick. There is in the North of England a long-wooled breed called the Westmoreland, and in Yorkshire another of a somewhat similar kind called the Wensleydale. Both are rent-paying sheep and are more hardy than the Leicester with which they have been crossed. At the Derby Royal show, of Singleton Park, Kendal, took the second prize, belonging to Mr. J. Thompson, animals of the Devon long wool and Wensleydale breeds. It was stated that the sheep had clipped 27 pounds of wool the previous April.

The Oxfordshire.—The Oxfordshire breed deserves consideration next, as standing between long-wooled and short-wooled varieties. It is in fact a hybrid derived from Cotswold and Hampshire; but which for many years has, by careful selection, been brought to a tolerably uniform type. The best of the flocks are found in Oxfordshire, Bucks, Beds, and Hants, but the breed is very much extended owing to its wealthy character, and the combination of quality and quantity in the mutton carcass. It has been claimed that weights of carcass exceeding 30 pounds per quarter have often been obtained from wether hoggets a year old, and considering that the flesh is juicy and of equal quality to the Hampshire, it is very much in favor. Mr. John Treadwell, Upper Wilmchester, Aylesbury, Bucks, writes that from his flock of Oxfordshire Down sheep he lambs 240 ewes, and breeds about 100 shearling rams annually, which he sells at auction in July and August. The average at which they have sold for the past two years has been £23 9s. 6d. each. Many went to Germany to cross the Merinos. For thirty years Mr. Treadwell has worked this breed and kept up the pedigree. He claims for it adaptation to all climates, all soils and systems of management, and that the breed improves any other it crosses, especially the Merinos.

The Hampshire or Wiltshire Downs.—The principal district for the Hampshire breeds are South Wilt and North Hants, they being stronger and less refined in the one district than the other. The Hampshires are also bred to a considerable extent in Dorset, Berks, Cambridge, Surrey, Sussex, and Kent.

This breed appears to rival all others in early maturity, a characteristic very much favored in its development by the numerous watery meadows of the chalk district, allowing early lambing and good feeding in early spring.

Mr. William Parsons, of West Stratton, who has a celebrated flock of the Hampshire Downs, says that the Hampshire climate is often bitterly cold in winter, owing to the hilly and exposed position of the country. The subsoil of the sheep district is principally chalk, and much of the land is poor and thin. One of Mr. Parsons's greatest successes in the show yard was scored only last December at the Smithfields Club show, where his pen of sheep were adjudged one of the finest ever exhibited, while a pen of lambs belonging to Mr. W. Newton, of Berks, weighed no less than 6 cwt. 2 quarters 2 pounds at the age of ten months and two weeks. When it is considered that only one of the South Down wethers a year older exceeded this weight, it must be admitted that the early maturity of this breed is most astonishing. The breed is said to have derived its origin by an amalgamation of two old extinct ones, the Wiltshire Horns and Berkshire Notts, and subsequent crosses of South Downs.

The Shropshire.—The Shropshires are traced back to two very old breeds, the Longmynds and the Cannock Chase variety, with an overtopping of the Southdown on the amalgamated race. No native breed has extended so rapidly of late years, having run all over the northwestern part of the kingdom and the Midlands, being met with here and there, also, from Scotland to Cornwall, while there are some exceptionally good flocks in Ireland. Although growing to less weight than the Hampshire and certainly not so

remarkable for early maturity, the quality of the mutton of the Shropshire is superior, and only to be excelled by that of the Southdown.

While the sheep itself has considerable constitutional vigor and is said to bear a damp soil and humid climate, Shropshire hoggets are seldom mature until April or May, when they weigh from 18 to 20 pounds per quarter. The ewes are much more prolific than Hampshires or Southdowns, and often 50 per cent. of doubles has followed liberal management.

The Southdowns.—The Southdown stands ahead of either of the two preceding breeds in respect to purity of blood, there being probably none more so; still it has always been a marked feature of the breed that it is susceptible to varieties of type. This, however, is attributable to change of pastures, not to any cross of blood.

On the fertile grass lands of Norfolk, Berks, and some other counties, Southdowns have increased their size and become much larger than those which have been propagated for countless generations on their native Sussex hills. Southdowns are the pride of most show-yards, but are regarded in few districts nowadays as wealthy tenant farmers, rent-paying sheep. Still no variety of sheep has been more improved in its native county. Originally from 12 to 14 pounds per quarter was considered heavy weight for a two-year-old wether, the fleece having been only 2 pounds in weight. Now the product of wool is about doubled, and the wether hogget feeds to nearly 18 pounds per quarter at eighteen months old.

There are some good flocks of Southdowns in Dorset and Gloucestershire, no less than in their native county, as also in Norfolk, Cambs, and Berks.

Their characteristics are as follows: The bone is small, the body thick and cylindrical, the ears wide apart. Both the ears and forehead are well covered with wool, which forms a protection from fly. The eye is full, bright, and quick; the chest wide, deep, and projecting; the back flat to the tail, which is set on high; the hind legs are very full on the insides and wide apart.

The Southdown, when crossed with long-wooled sheep, produce an animal having a large frame and yielding excellent mutton. The fleece is short, curly, and fine. The wool may be classed amongst the finest qualities, and is the shortest staple wool of Great Britain. It is now used chiefly mixed with Australian wools.

On the subject of Southdowns I transmit with this report two valuable papers as inclosures, first (inclosure No. 3), a paper entitled "Southdown sheep, their history, breeding and management," read by Mr. Henry Woods, of Merton Thetford, before the Institute of Agriculture, at the South Kensington Museum, March, 1884; and second (inclosure No. 4), a paper on Southdowns and Cambridgeshire farming, which gives a succinct history of the celebrated Babraham flock of modern Southdowns.

The Suffolk Downs.—The Suffolk Downs are descended from the old horned Norfolk, crossed by the Southdowns. Although not very symmetrical in form, they are very hardy and useful on the strong lands of Suffolk and poor sands of Norfolk; they are also found in Cambridgeshire. They have black faces and legs, with long donkey ears.

In West Suffolk they have been much improved of late, probably by the impress of Hampshire rams. The Smithfield Club has allowed them a wether and lamb class at the December show, and the lambs have put in a formidable appearance, sufficient to justify a claim that well-managed flocks are not deficient in early maturity. The heaviest pen at the last show was that of Mr. E. Tyson, of Silverley, Newmarket, which at nine months two weeks old scaled 5 cwt. 1 quarter 22 pounds.

The Dorset Horns.—This breed like hilly pastures of moderate elevation, and few other breeds are kept in Western Dorset from Dorchester to Beaminster, and also in continuation of the same district in South Somerset from Yeovil to Crewkerne and Chard. There are some good ram-breeding flocks also on the slopes of Quantock, below Bridgewater. The ewes are remarkably prolific, frequently yielding twins and triplets at a birth, and with good feeding will produce two crops a year. This has been the breed always chiefly depended upon in the production of early lambs. Draft ewes, after having been put to a Southdown ram, are brought to Weyhill fair in October and purchased by Berks and Horne Counties farmers, who prefer to have them lamb down in November and December. The wethers and old ewes, when fattened, make good weights. Mr. Herbert Farthing's twenty-three-months-old wethers at the late Smithfield show scaled 7 cwt. 23 pounds to the pen.

The Cheviots.—The Cheviots derive their name from the Cheviot hills. They are really a mountain breed, but are illadapted to very high ranges. They may be described as follows: They are prolific and good nurses; they have no horns. The faces are large and white, with no wool on the head. The eyes are lively and prominent; the ears long and well covered with hair; the chest is full. Their thick wool makes them very hardy. The wool is short and of medium quality, but with good spinning qualities. It, however, varies much, and is chiefly used for making a soft yarn.

The breed emanated in Northumberland, but from a limited range along the course of the Tweed they ultimately displaced the black sheep from all the lower Scottish

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hills. Originally the carcass weight of Cheviots exceeded seldom 12 to 15 pounds per quarter, but now from 18 to 22 pounds per quarter is frequently obtained. A useful cross for lowland grazing is that of Leicester rams with Cheviot ewes.

The Mountain Sheep.—The mountain sheep of Great Britain are the black-faces of the Scotch Highlands, found in Lanark, Ayr, Dumfries, Peebleshire, Roxburghshire, and Sterlingshire. They are extremely active and hardy, capable of enduring cold and get it. They are good mothers.

They have a shaggy fur and coarse open wool of middle length, or rather long, inclined to curl, but is hempy, and only fit for the coarsest description of manufactures, such as carpets, &c. The face and legs are black. The males have large spiral horns, and the females also are mostly possessed of horns, but smaller. The face is long, the muzzle free from wool, the ears long, and the eyes quick and lively.

The Herdwick.—The Herdwick breed is said to surpass even the black-faces in hardihood. They are propagated in the fells of Cumberland, Westmoreland, and a small portion of Lancashire.

These sheep are very active, and it is difficult to retain them within any inclosure. They will return from almost incredible distances if removed from their native runs. The fleece is thick and matted together. The wool is rather shorter in staple and finer in quality than that of the black-faces.

The Lanks.—This breed originated in the hill ranges of Lancashire and Yorkshire, but have extended themselves to the peaks of Derbyshire on the one side, and through the mountain ranges of the North of England, even to Scotland, on the other. Their faces are picturesque, being streaked black and white, as are also the legs. Their horns are curled and of a yellowish tinge. They often graze almost equally well with the Cheviots. Three-year-old wethers from the Fell, fed on good grass land, weigh about 18 pounds per quarter.

The Exmoor.—The Exmoor is a mountain race, native to West Somerset and North Devon, and belongs to the elevated range, running from Minehead to South Molton, and to the Forest of Exmoor. The wethers run on the hills for three or four years, yielding fleeces which average from 4 to 5 pounds each. The ordinary Exmoors will then fatten to about 15 pounds per quarter; but highly improved flocks are now found in which early maturity has been induced, so that at eighteen months the wethers fatten to 18 pounds per quarter, but these do not of course run on the mountains.

Of all mountain sheep the Exmoors are the most shapely, really forming models with their round barrel-like forms. They are short, thick, compact, and have short legs, horns curling downward and outward, white faces, legs, and fleeces, which are rather long, the wool coming well up to the cheeks. An excellent cross for lowland feeding is that of the Leicesters with the Exmoors.

Welsh Mountaineers.—This is a diminutive breed found quite generally in the elevated ranges. They are a small-horned breed, wild and active, and frequent the highest parts of the mountains, thriving on scanty food, and feeding on alpine aromatic herbs, which, no doubt, are the sources of the fine flavor of Welsh mutton, which is highly prized. Their faces are usually white, but sometimes speckled or gray. Even at four years old the fat wethers seldom yield a carcass of more than 40 pounds; and if a leg of mutton weighs over 4½ pounds it is deemed of doubtful purity.

A cross with the Cheviots has done well on some of the less elevated tracts of Wales. There is a variety of Welsh sheep called the "Radnorshire," which has lately been improved. They are prolific and excellent nurses. They are hardy and capable of enduring mountain storms, while the mutton is fine flavored. This breed is confined very much to the county giving its name, and even there has been much crossed with the Shropshire.

The Wicklow and the Kerry.—These are the mountain breeds of Ireland; the former resembles the Dorset in a remarkable propensity for early fecundity, but are much smaller in size, bearing affinity in this respect to Welsh sheep. The breeding flocks are on the Wicklow Mountains, but farmers in the neighborhood of Dublin buy draft ewes for the production of early fat lambs. The Kerrys, on the other hand, are found in the west of Ireland. Sheep of this breed are larger in size than the Wicklows, but very coarse-boned and unthrifty, taking a long time to mature.

The Shetland.—These sheep are natives of the Shetland and Orkney Islands. Most of them are polled, but some of them have small horns resembling the goat. They are of small size, weighing when fattened only from 7 to 10 pounds per quarter.

BREEDS OF SHEEP AT THE PARIS SHOW.

As regards the exhibition of sheep at the Paris show, 1883-'84, which, among others, included a prize group of Southdowns bred in the Nièvre, I transmit herewith (inclosure No. 5) a note from H. Kaius Jackson on the different breeds, with his critique upon the same.

WEIGHTS OF SHEEP.

As furnishing a very complete record of the age and weight of sheep of different classes at the Islington show and the average gain per day in pounds of the several animals, as also the comparative daily rate of increase in the classes for lambs and wethers of the different breeds, &c., I forward (inclosure No. 6) some tables on the subject published in the Mark Lane Express, of December 24, 1883.

SHEEP AND MUTTON IN 1883.

A paper, under this heading (inclosure No. 7), taken from the Live Stock Journal Almanack, furnishes a very complete list of prices at which the sheep of the various breeds of the country sold in the markets during the past year.

PORTRAITS OF SHEEP.

Inclosure No. 8 is said to furnish excellent portraits of three noted animals, to wit: An Oxford Down ram, which is considered a fitting illustration of the breed; a three-year-old Lincoln ram, "Hermit," and an Oxford Down ram, "Campsfield," three years and five months old.

II. BREEDS OF PIGS.

The Berkshire.—The Berkshire is a most extensively cultivated and a very valuable breed. The animals are usually rather above the medium size. The prevailing colors black and white, the white generally being on the nose, feet, and end of the tail. Some are, however, almost entirely black. These differences are attributed by some writers to the influence of either Chinese or Neapolitan blood with which they are allied. The Berkshire pig is altogether thoroughly useful in its character, fulfilling in all points the requirements of modern farming. One of its great merits is the large proportion of lean meat to the fat and the distribution of fat and lean when properly fed. As a result of this a given live weight realizes a larger proportion of available meat than any other breed. The late Mr. William Hewes was for many years a most successful breeder of Berkshires, having a favorite sow which on one occasion yielded fifteen pigs in the year, the produce of two litters, for which £150 was realized, the pigs having been sold when quite young at £10 each. This breed is especially adapted for bacon of excellent quality.

The points of the improved Berkshire are as follows: The head is moderately long, the ears somewhat projecting, but not drooping; the skin has a slight tinge of pink; the eyes are large and intelligent; the hind quarters often droop rather too much; the legs are short; the hair is abundant and indicates great hardness of constitution.

Mr. Joseph Saunders, of Sutton Wimborne, Dorsetshire, whose specialty is pigs, writes (inclosure No. 9) recommending the Berkshire breed as the hardiest. It should be noted that one of this breed took the champion prize at the last Smithfield show. At the age of eight months one week three days its weight was 16 score, or 320 pounds.

Mr. Alfred Ashworth, of Woodham, Chelmsford, bears witness (inclosure No. 10) to the excellence of the Berkshire breed of pigs. As a successful exhibitor and breeder Mr. Ashworth finds a ready demand for his stock for breeding purposes, a fact that may be emphasized as showing the extending demand amongst farmers and others for the best breeds.

The Large White or Yorkshire.—This breed is cultivated principally in the counties of Yorkshire, Lancaster, Lincolnshire, and Leicestershire, and it is probable that it is descended from the old English pig. Mr. Ronaldson, in his prize essay on the breeding of pigs, says:

"There are good grounds for supposing that the old English hog with flop ears was originally the only domestic animal of its kind in the Kingdom. The genuine old English breed was coarse boned, long in limb, narrow in the back, and low shouldered, a form to which the animals were most probably predisposed, from the fact of their having to travel far and work hard for their food, undergoing at the same time considerable privation during the winter."

A great improvement has been effected in this breed by careful selection and greater attention to feeding. It is said that Bakewell was the first to improve the Leicestershire pigs, and this by a process similar to that which proved so successful in the case of the

long-horned large, coarsely bred, is probably proved Leicestershire, and quality of meat the character of ears, very large, sided, and are therefore size, and the

Mr. Sanderson, in his classification, writes that he has seen his yards of white, are like white" breed prolific but

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The small animals have ward, and m which is usual ever, is general shoulders are deep and square. The small white often are almost lean. This breed special

The Suffolk the abundance and slightly excellent, the but parallelogram They possess

Mr. J. A. S. society at Hamb his breed of S town he farm gress. This in respect to the to Mr. Smith's exposure to the

Dorset.—Th doubt it origi pigs are deficie symmetrical, a noses and legs

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long-horned cattle and the Leicester sheep, viz. by selection; that is, discarding the large, coarse animals, and selecting such as were more symmetrical and finer boned. It is probable that the first step in the improvement of the Yorkshire was through the improved Leicestershire pigs; certain it is that at one time they were particularly uncultivated, and are described as "of large size, gaunt, greedy, and unthrifty; coarse in the quality of meat, flat-sided, and huge-boned." The present Yorkshires still have some of the characteristics of the original breed, viz. a long head, overhanging and drooping ears, very long bodies, but narrow in proportion to the length. They are therefore flat-sided, and the hind quarters usually droop. They do not come to early maturity, and are therefore usually kept till they attain their full growth. They then attain a large size, and their meat is specially suitable for curing as bacon and ham.

Mr. Sanders Spencer, a breeder of high repute of Holywell Manor, judge in the pig classes at the best English shows, and the honorable secretary to the pig-breeders' association, writes (inclosure No. 11) that the demand for his breed of pigs has been such that he no longer competes at the various shows, private inquiry being sufficient to clear his yards of surplus stock. Mr. Spencer's remarks, after his twenty-five years of experience, are likely to be of special service. He speaks of the "middle white" and "large white" breeds as being far the best of all. The common English pig is a "brute very prolific but ruinous to fatten."

Mr. Joseph Saunders, above referred to, has also found the "large white" breed a very capital one. This breed, I may here record, were notably successful at the international summer exhibition at Hamburg in July last, where the crosses of English pigs with German breeds were a subject of general commendation.

The middle-sized white.—These have no doubt been produced by a cross between the large and small white breeds; they possess many of the good qualities of each breed, and are very useful. They combine aptitude to fatten quickly, having plenty of flesh without coarseness, and hardness of constitution. They are good breeders, being more prolific than the small white breeds, and they are good mothers. They vary a good deal in characteristics, sometimes approaching the large and sometimes the small varieties, and may be said to be more fitted for bacon than for pork.

As observed by Mr. Sanders Spencer, this is considered one of the best of breeds.

The small white.—This breed differs from the large white in many respects. These animals have very short noses, slightly turned up; their ears are sharp and project forward, and may be termed "prickears." The body is covered with curly white hair, which is usually rather long, but in some cases it is thick and short. This breed, however, is generally rather delicate in constitution, and will not bear exposure. The shoulders are very wide and full, the back straight, the tail is set on high, the legs are deep and square. The bone is fine; the carcass is thick, compact, and very symmetrical. The small white breed possess a wonderful aptitude to fatten, so much so that the eyes often are almost hidden; but there is an undue proportion of fat in comparison with the lean. This breed, however, is extremely useful for crossing with larger and coarser varieties of pigs, and they generally improve the quality. Its early maturity makes it a breed specially adapted for dairy farms and for killing as small "pork."

The Suffolk.—These pigs are of a small black breed, well coated with long, soft hair, the abundance of which indicates that they possess good constitution. The nose is short and slightly turned up, and the ears are short, projecting forward, the shoulders are excellent, the back is straight, the tail is set on high, and the general form is that of a parallelogram and very symmetrical. The skin is not apt to crack, as in some breeds. They possess great aptitude to fatten.

Mr. J. A. Smith, who acted as delegate-judge for the English Royal Agricultural Society at Hamburg, and has taken many prizes, writes (inclosure No. 12), in reference to his breed of Suffolk pigs, and says that the mean temperature at Ipswich, near which town he farms, is fifty degrees; summer temperature, sixty degrees; winter, forty degrees. This indicates a good climate, but the figures can hardly be accepted as exact in respect to the district. They probably refer to a particular season. Attention is directed to Mr. Smith's preference for black over white pigs. He observes that the farmer stand exposure to the sun's rays when feeding better than the latter.

Dorset.—This is a black breed, showing a great resemblance to the Neapolitan. No doubt it originated from a cross with the Neapolitan and other black breeds. These pigs are deficient in hair; their skin is dark; they are very handsome, thick, wide, and symmetrical, and they possess a great aptitude to fatten. Their ears point forward, and their noses and legs are short, and the animals are usually very handsome.

Improved Essex.—There is a great similarity between the Essex and Dorset breeds, both evidently possessing a good deal of the Neapolitan blood. They are black. The Essex have rather longer heads, with straighter noses, somewhat inclined to slate color, and have not much hair. Their aptitude to fatten is excessive. They are extremely handsome in every respect.

Tamworth.—This is a breed whose chief distinguished characteristic is that the color is red. They are very hardy, useful pigs.

Irish.—The native pigs of Ireland are a large kind, with coarse bones, very hardy, and thriving well on scanty food. The ears large, and long, strong hair; some are white, some black and white, and some spotted, but of late they have been very greatly improved by crossing with Berkshire and other varieties, and a large number of useful animals resulted; thus a vast amount of cheap and useful food has been produced.

The foregoing notes on the various breeds of sheep and pigs have been compiled from sketches of the same by the president of the Royal Agricultural Society of England, Sir Brandreth Gibbs, supplemented with information from Mr. Joseph Darby, author of a work on sheep, letters from correspondents, and other trustworthy sources.

As a proper accompaniment to these notes, I beg to transmit (inclosure No. 13) a descriptive volume on the sheep and pigs of Great Britain, of approved value, elegantly bound, and superbly illustrated with types of the several breeds referred to.

The foregoing observations, with inclosures accompanying, on the different breeds of sheep and pigs may be found of service at home.

E. A. MERRITT,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
London, March 25, 1884.

COTSWOLD SHEEP.

REPORT BY H. T. ELWES, COLESBORNE PARK, CHELTENHAM.

[Inclosure No. 1 in Consul-General Merritt's supplementary report.]

This breed is one of the oldest in England, and its origin is lost in obscurity, at any rate the district was a celebrated one for long-wooled sheep three centuries ago, and though in the beginning of this century Leicester rams were used to correct the coarseness of the native breed, there is probably no other in England, except the Southdown, so like in general appearance to its original stock. The Cotswold Hills are a poor, exposed district in the west of England, and though the breed has spread into Norfolk, South Wales, and other parts, yet it changes character more or less when removed from its native hills. These consist mostly of arable land, cold, clayey, and sticky in winter; rain-fall heavy, from 30 to 45 inches; harvest late, never finished before October; land mostly rented at from 5s. to 15s. per acre. The geological formation is oolite limestone, and this is considered to have much influence in maintaining the true character of the breed. The Cotswold sheep is larger than any other in the world except the Lincoln, which it much resembles in most points, though the wool is not quite so fine on account of the inferiority of the soil and climate.

The size of old rams is often immense. There are several instances on record of sheep weighing from 80 to 90 pounds per quarter, skinned and dressed. The ordinary weight of sheep a year old when they are usually killed is about 150 pounds; but wethers fed by myself have weighed up to 67 pounds per quarter dead weight, at twenty-one months old, and my lambs which took the cup as the best pen of this breed at the Islington show in December, 1883, weighed alive at ten months old 200 to 206 pounds each, and the dead weight was 33 to 34 pounds per quarter, or within a trifle of two-thirds the live weight. The wool averages through a whole flock, including ewes, about 10 pounds per fleece, clean washed, but individual sheep have clipped as much as 24 pounds. It is long and very strong, suitable for any hard-wearing fabrics, especially horse-girths and blankets, and is worth at the present time about 1s. per pound, or 1d. less than the finest Lincoln or Leicester wool.

The meat is equal to either of these breeds, but inferior to that of Southdowns or Shropshires, having a tendency to produce fat rather than lean meat. In early maturity, hardness, endurance of cold and wet the Cotswold is far superior to Lincolns or Leicesters, and for crossing with other breeds which are deficient in early maturity and fattening qualities is, perhaps, the most valuable in the world.

All the finest cross-bred sheep in England, notably the Oxford breed, are or have been produced from Hampshire ewes by a Cotswold ram, and it has been proved that the crosses between Merino and Cotswolds are heavier at a year old than pure Merinos at two years old, the wool at the same time being much heavier and coarser. Sandy districts or rich low-lying plains do not suit the pure Cotswold sheep; but as they are never sheltered in the winter in their own country they can endure a great deal of cold without

injury, the lambs of their mother.

Grass, clover, vember; hay; that Cotswold other breeds.

Purchaser rams got up and climate lambs are purchased, and are ing through good flock and direct from flock is from lambs can be to £8, and the old. My flock counted when the whole number.

COLESBORNE
Cheltenham

My breed lambs, 9 months is all arable seeds, and in 10 pounds to

SOUTHDOWN

Lecture delivered in the Lecture Hall, Cheltenham

[Inclosure]

Mr. Wood's Southdowns of Sussex existed there before the Cotswold breeds in Britain comparatively when (as Mr. Wood) been nearly all into this country. The sheep were then bestowed they came to be useful essays world, first carefully constituted

injury, the lambs when quite young being always allowed to run out in the fields with their mothers, and are healthier when so treated than when coddled in sheds.

Grass, clover, and sainfoin are the principal food for these sheep from May till November; hay and turnips in winter, and it has been proved by Mr. Lawes's experiments that Cotswold sheep made a greater and quicker return for their food than any of the other breeds which he tried against them.

Purchasers of Cotswold sheep for export should be careful not to buy very heavy, fat rams got up for show, as these often suffer on a long journey and feel the change of food and climate more than ram lambs or year-old sheep. For crossing with inferior sheep lambs are preferable to older rams, as they are lighter, more active, and cheaper to pur- chase through dealers are usually put off with the inferior or second-rate animals from a direct from the breeder. The present value of pure Cotswold rams from a pedigree flock is from 8 to 20 pounds, though much higher prices are paid by ram breeders. Ram to £8, and their produce, if properly managed and fed, will pay for the mothers at a year old. My flock usually consists of 500 ewes, which produce annually 600 to 650 lambs, the whole number kept, including lambs, and the sale is held annually in September.

H. J. ELWES.

COLESBORNE PARK,
Cheltenham, Gloucestershire, January 2, 1884.

LONG-WOOL LINCOLNS.

NOTE BY MR. MACKINDER.

[Inclosure No. 2 in Consul-General Merritt's supplementary report.]

My breed of sheep is Long-wool Lincolns and exhibited at the Smithfield show; lambs, 9 months old (live weight), 14 stones, and ewes, 3 years old, 26 stones. My farm is all arable loam, with limestone subsoil. Sheep in summer pastured on one year's seeds, and in winter on turnips in field; not housed; weight of wool when clipped, from 10 pounds to 30 pounds washed.

JOHN W. MACKINDER,
Mere Hall, Lincoln.

SOUTHDOWN SHEEP—THEIR HISTORY, BREEDING, AND MANAGEMENT.

Lecture delivered by Mr. Henry Wood, of Merton, Thetford, to the Institute of Agriculture, in the Lecture Theater of the South Kensington Museum, in March, 1884, Lord Walsingham presiding.

[Inclosure No. 3 in Consul-General Merritt's report; from Bell's Weekly Messenger.]

Mr. Wood said: The Southdown breed of sheep is believed to be indigenous to the Downs of Sussex. It is said by the editor of The Farmer's Dictionary to have existed there before the Conquest. It is, no doubt, one of the purest and most unmixed breeds in Britain. Little seems to have been known about Southdown sheep outside the comparatively limited area in which they were kept until about two hundred years ago, when (as Mr. Thomas Ellman writes) several flocks on the Southdowns appear to have been nearly annihilated by an outbreak of the small-pox disease, which was imported into this country from Holland about that time.

The sheep which the disease spared attracted rather more notice than had previously been bestowed on the breed, but it was not until the latter part of the last century that they came to be much esteemed. It was, in fact, Mr. Arthur Young, who, in one of those useful essays published about 1794, which made his name famous in the agricultural world, first called public attention to Southdown sheep, speaking favorably of their hardy constitution and of the fine quality and flavor of the mutton they produced.

About the same time they were also described by other writers as being speckle-faced, long and thin in the neck, high on the top of the shoulders, slack in the girth, high and narrow on the lion, low at the rump end, with tail set on very low, sharp on the back, flat-ribbed, narrow in the forequarters, and generally, though with little space between their forelegs, showing a fairly good leg of mutton. As a rule they were looked upon as plainly formed, if not ugly sheep, which produced good and fine-flavored flesh. They were small, very small, as compared with the Southdowns of the present day.

To Mr. John Ellman, of Glynde (the father of the late Mr. John Ellman, of Landport, and Mr. Thomas Ellman, late of Beddingham), will most deservedly always belong the credit not only of bringing Southdown sheep into more general notice, but of commencing (about the year 1780) a course of valuable, well-considered, skillful, and successful experiments upon them. These experiments were conducted by him with slow and steady good effect during the long period of more than half a century. In justice to the memory of one who so earned the gratitude of sheep-breeders, not only in this country, but in various parts of the world, I will quote to you his well-founded and practical opinion as to what an improved Southdown sheep should be; and I would impress upon you the desirability of carefully studying those remarks, with which I thoroughly agree, except as to two particulars, which I will point out to you later on.

Mr. John Ellman says*: "The head should be small and hornless; the face speckled or gray, and neither too long nor too short; the lips thin, and the space between the nose and eyes narrow; the under jaw or chop fine and thin; the ears tolerably wide, and well-covered with wool, and the forehead also, and the whole space between the ears well protected by it, as a defense against the fly; the eyes full and bright, but not prominent; the orbit of the eye (the eye-cap or bone) not too projecting, that it may not form a fatal obstacle in lambing; the neck of a medium length, thin towards the head, but enlarging towards the shoulders, where it should be broad and high, and straight in its whole course above and below; the breast should be wide, deep, and projecting forwards between the fore-legs, indicating a good constitution and a disposition to thrive. Corresponding with this the shoulders should be on a level with the back, and not too wide above; they should bow outwards from the top to the breast, indicating a springing rib beneath and leaving room for it; the ribs coming out horizontal; from the spine and extending far backward, and the last rib projecting more than the others; the back flat from the shoulders to the setting on of the tail; the loin broad and flat, the rump long and broad; and the tail set on high and nearly on a level with the spine; the hips wide; the space between them and the last rib on either side as narrow as possible, and the ribs generally presenting a circular form like a barrel; the belly as straight as the back; the legs neither too long nor too short; the forelegs straight from the breast to the foot, not bending in at the knee, and standing far apart both before and behind; the hocks having a direction rather outward, and the twist, or the meeting of the thighs behind, being particularly full; the bones fine, yet having no appearance of weakness, and the legs of a dark color; the belly well defended with wool, and the wool coming down before and behind to the knee and to the hock; the wool short, close, curled, and fine, and free from spiky projecting fibers."

Mr. Ellman's description of the main points which constituted a symmetrical and well-bred Southdown sheep early in the present century may be accepted as the essential requirements of a good Southdown sheep at the present time, with the two following exceptions, viz, speckled faces and the set-on of the tail. A speckled face is very properly no longer looked upon as denoting a pure-bred Southdown sheep. The face and legs should be of a nice mouse color, neither too dark nor too light, but of medium tint. In fact, anything in the way of a white speck on the face or legs is now considered to show a defect in the purity of the blood. The other point in Mr. Ellman's description of a well-made Southdown sheep with which I cannot agree is the set-on of the tail. Mr. Ellman says the tail should be "set on high, and nearly on a level with the spine." I am of opinion that if a sheep's tail is placed on a level with the spine the position is an unnatural one. I have generally found, too, that when the tail of a sheep has been placed very high the back has been weak and not well covered with flesh. There is a right and wrong position for the tail of a sheep, and to be right it should be neither too high nor too low.

Notwithstanding the great improvement which Mr. Ellman effected in the breed, it was some time before Southdown sheep won their way into public favor, if we may judge of this by the prices which they made. But we must bear in mind that in those days sheep, even of the most esteemed breeds, did not realize high prices. It appears, however, from an article in the *Agricultural Annual* of that date, that in 1836 there was a considerable increase in the value of Southdown sheep, the breed having become better known, and its merits then more fully recognized. In the year 1787 a Southdown ram fetched for the first time as much as 10 guineas, Mr. Ellman selling two for £21 to Lord

Waldegrave, the same gentleman, of Nottingham, of Nottingham Boys, of Betts year Mr. Ma at 23s, a head 26s, each, and the Glynde e

From this into Norfolk, ment and pro certainly visi which he com to Mr. Coke would be suit sheep were s in Sussex, and giving as muc each for eight the Glynde ev noblemen and down sheep in by Mr. Ellman years, there w ranging from two hundred c him 300 guine price ever mac soon rose to 3 for the sale of four years.

The next pe sheep was the sheep-breeder was a true rep will be remem distinguished farmer, and no ness."

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*Farmer's Dictionary, vol. 2, p. 534.

Waldegrave, of Essex. In the previous year Mr. Arthur Young bought eighty ewes of the same gentleman at 18s. a piece. These were sent into Suffolk. In 1789 Mr. Ramsden, of Nottinghamshire, bought forty ewes from the Glynde flock at 25s. each, and Mr. Boys, of Betsahanger, in East Kent, gave Mr. Ellman 8 guineas for a ram. The same year Mr. Macro, of Norfolk, acquired from the same flock one hundred and seventy ewes at 23s. a head. In 1790 Mr. Crowe, also of Norfolk, bought of Mr. Ellman forty ewes at 26s. each, and a ram at 12 guineas. In 1791 Mr. Boys gave 31s. 6d. per head for sixty of the Glynde ewes.

From this year I believe we may date the increased introduction of Southdown sheep into Norfolk, under the auspices of that renowned encourager of agricultural improvement and progress, Thomas William Coke (afterwards Earl of Leicester). Mr. Ellman certainly visited Holkham in the year 1790. Having seen the Norfolk breed of sheep, which he considered more remarkable for their activity than anything else, he suggested to Mr. Coke the desirability of a trial of a few Southdown ewes to see how far they would be suited to the soil and climate of Holkham. Mr. Coke assented. As his own sheep were sold, Mr. Ellman bought five hundred ewes and lambs from the best flocks in Sussex, and sent them to Holkham, with four rams from his own flock; Mr. Coke giving as much as 70 guineas for these rams. In 1793 Mr. Coke paid Mr. Ellman 35s. each for eighty ewes, and in 1794 the Earl of Ergemont gave 2 guineas each for fifty of the Glynde ewes. After this Francis, Duke of Bedford, the Duke of Norfolk, and other noblemen and gentlemen, visited Glynde, and were the means of introducing Southdown sheep into different counties. The first ram that ever fetched 50 guineas was sold by Mr. Ellman in 1796 to Mr. Goodenough, of Dorsetshire. From that time, for many years, there was a steady demand for all the rams Mr. Ellman could supply at prices ranging from 20 to 100 guineas each for the season. In 1800 Mr. Ellman disposed of two hundred ewes to the Duke of Bedford for 500 guineas, and in 1802-'3 his grace paid him 300 guineas for the use of a ram for the two seasons, which was the highest letting price ever made by a Glynde ram. The price at which Mr. Ellman sold his draft ewes soon rose to 3 guineas each, and afterwards to 4 guineas, at which price he contracted for the sale of the whole draft to one person (Mr. George Talbot, of Gloucestershire) for four years.

The next person who did much to improve and popularize the Southdown breed of sheep was the late Mr. Jonas Webb, of Babraham, in Cambridgeshire. This eminent sheep-breeder well deserved the respect in which he was held throughout his life. He was a true representative man, of whom his country might well be proud. His name will be remembered for ages to come, and he will be spoken of as one of England's most distinguished breeders and improvers of Southdown sheep. Great was his success as a farmer, and no wonder, for he carried out what he undertook with vigor and "thoroughness."

His connection with Southdown sheep commenced when he was a young man. He entered upon a series of experimental trials with several different breeds of sheep in order to find out which breed was most suited to the Cambridgeshire uplands. At that time Mr. Webb had no particular preference for any one breed, but after exhaustive trials he fully satisfied himself that Southdown sheep produced the greatest weight, and gave the best quality of mutton for the amount of food consumed, and were consequently the most profitable both to breeder and grazier.

These trials determined Mr. Webb to have nothing to do with any other breed of sheep than Southdown. He therefore purchased for the Church Farm, at Babraham, ewes and rams of the late Mr. John Ellman, of Glynde, and other breeders in Sussex. Having started it he gave unremitting attention to his flock, and soon witnessed a gradual but sure improvement in its character. His first letting of rams by public auction took place in 1836. These lettings were continued annually down to the year 1860.

Many will remember the Babraham Ram Lettings, and the annual dinner which followed, with mingled feelings of pleasure and regret; pleasure in thinking over those days, and regret that such meetings are now things of the past. Who can forget the long and gaily-decked wagon-lodge which formed a characteristic banqueting-hall, filled with agriculturists, and among them many leading noblemen and gentlemen, who came not so much to do business as to pay honor to an old friend; who does not remember the late Earl of Hardwicke, with his burly John Bull form and manner, seated at the head of the guests delivering his pithy speeches, replete with humor and happy hits on current topics; who does not recall the jolly, cheerful, Sam Jonas, acting as master of the ceremonies, and his face giving off radiance enough to have lighted up the place without the aid of candles; or the lithe and active John Clayden, who was here, there, and everywhere, with a kind word for everybody; or the host himself in his seat at the bottom table, supported by his friend and opponent in Southdown breeding, William Rigden, and by the tall and spare form of Jem Turner, of Chyngton, one of the best judges of

Southdown sheep that ever lived! Those were indeed meetings, the like of which will never be seen again. But to resume our narrative.

In 1855 a two-year-old ram was let for the season for 170 guineas, and in 1860 a yearling was sold, after being used at Babraham, for 250 guineas. These were, I believe, the highest prices made by Babraham rams. As might be expected, Mr. Webb was a most successful exhibitor of Southdown sheep at the Royal and other agricultural shows. His first prize was won at the Essex show, held at Saffron Walden. He was subsequently awarded prizes for his sheep at exhibitions in Ireland, Scotland, and France. He first exhibited at the Royal Agricultural Society's meeting at Cambridge in 1840, where he received the first prize for ewes. He continued to exhibit with marked success at most of the Royal shows down to and including the Canterbury meeting in 1860, when he made a clean sweep of the prizes for rams.

In 1861 the Babraham ewes and rams were sold by auction. They realized £10,926. In the following year (1862) the shearing rams and ewes born in 1861 were also publicly disposed of, and brought £5,720. Thus the entire Babraham flock fetched the large sum of £16,646. Surviving but a few months the dispersion of his favorite flock, the owner passed away in November of the same year. Such is the history of the Glynde and Babraham Southdown flocks.

Here I would venture to remark that while the owners of the flocks of which I have just spoken were scrupulously careful to maintain the purity of the breed, each aimed at a different type of animal. "Small and good" sheep were clearly Mr. Ellman's aim, and Mr. Webb's, "large and good." Believing that large sheep were much the best, and would be the sheep of the future, I need not say how well Mr. Webb succeeded in producing animals of larger frame and greater weight than the Southdowns of Mr. Ellman's day, while at the same time retaining the true type and all the essential points of a pure-bred Southdown sheep.

It is, of course, a recognized fact (or ought to be by every careful breeder of Southdown sheep) that the first and greatest point is to maintain extreme purity; to allow no cross to diminish the inestimable value of purity of blood. The direction in which improvement in Southdown sheep is desirable is uniformity of character, strength of constitution, excellence of wool, development of symmetrical form, mutton-producing properties, smallness of bone as compared with weight of meat, yet not such smallness as to prevent the carrying of an increased amount of flesh.

THE MERTON FLOCK.

I may say that these are the points to which our attention has been always most especially directed in the flock of which I have now had the management for upwards of thirty-six years. It is not for me to say how far we have been successful; indeed, I must ask you to excuse me if, in illustration of my subject, I am in some degree compelled to refer to the Merton flock. I shall do so very briefly, and only when it enables me to trace more clearly the history of progress and improvement than could be done by reference to other flocks with which I am less intimately acquainted.

Following the subject of increase in weight, I find myself obliged to mention the three shearing champion prize Merton wethers of 1870, which averaged a little over 242 pounds each, live weight. This I believe to have been the greatest weight recorded up to that time. Some persons, indeed, at the exhibition thought that the great weight of those sheep suggested that there had been some cross in the breeding. I need scarcely say how utterly groundless was any such suggestion. The same imputation had been before laid to the charge of Jonas Webb. When he succeeded in producing large Southdown sheep of true type, and with as much quality as the small sheep of former times, he, too, was suspected of having recourse to a cross with some other breed, but the suspicion was as unfounded in his case as in ours.

Since the Smithfield Show of 1870 other Merton pens of shearing wethers have been exhibited of nearly the average weight of the champion sheep of that year, and no question as to the purity of their breeding was ever so much as hinted at.

At the late Smithfield Exhibition Lord Walsingham's prize pen reached the unprecedented average for Southdown wethers of 251 pounds. This showed an increased weight of 9 pounds per sheep over the weight of the champion wethers of 1870, to which I just now referred, and of 26 pounds as compared with the weight of the champion wethers in 1882.

I have no intention of trying to make it appear that with the Merton flock more has been accomplished than may be done by other flocks, or of keeping from you those particulars of management to which is due that largeness of frame and excellence of mutton without the infusion of any blood but that of the purest Southdown, to which the Merton sheep have attained.

There are, of course, many excellent pure-bred flocks of Southdown sheep in this country whose history, peculiarities, and merits I am obliged, through stress of time,

to pass over. The present day the Earl of Colman, Mr. Fringe, H. H. though not

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to pass over. But standing in the front rank of successful Southdown breeders at the present day we are naturally reminded of the Prince of Wales, the Duke of Richmond, the Earl of Suffolk, Lord Arlington, Sir William Throckmorton, Bart., Messrs. J. J. Colman, M.P., G. and R. Emery, John Ford, Henry Fookes, G. C. Gibson, Hugh Goringe, H. Humbrey, A. Hensman, J. Hempson, F. M. Jonas, George Jonas, and last, though not least, my excellent friend Henry Webb.

HOW TO FORM A FLOCK—PRACTICAL SUGGESTIONS.

In the formation of a flock of Southdown or any other breed of ewes great care and judgment are, of course, most essential. Uniformity of character, so that the ewes look as much alike "as peas in a peck," should be your first object. If you desire to judge of the general character of a flock of Southdown ewes, and to see if they have, as it were, a family likeness, have them driven a short distance from where you stand and then suddenly wheeled round so that their heads are thrown up and their faces seen at a glance. This will enable you to detect any marked want of uniformity, if there be any. In a word, the ewes should be "matching" to the eye. When drawing the selection, carefully noting individual formation and peculiarities, so that the ewes in each lot are as much alike as possible, and adapted to the style of ram you intend to put to them.

There is no flock so perfect but some defects will be found in the ewes which require correcting, and, therefore, care should be taken to use a ram which will be likely to improve in the offspring the faulty points observable in the ewes. It must, moreover, be a matter to which the flockmaster gives anxious attention in selecting a ram that in correcting defects in the ewes he does not overlook any faulty points in the ram which may be transmitted through the ewe and thereby create imperfections in the lamb which the mother did not possess.

Only by practice and carefully observing the true principles of breeding is the flockmaster able to make a proper and judicious selection of rams and ewes so as fitly to mate them. I therefore desire to impress upon you, agricultural students, the absolute necessity of your becoming thoroughly and practically acquainted with the good and bad points of sheep, no matter what their breed, remembering that the same care and skillful judgment requisite for the successful management of Southdowns are also required in the management of other flocks.

Each breed has its own marked peculiarities, faults, and merits, which must be well studied and carefully looked after or a man will never become a good and successful sheep-breeder.

BREEDING.

Remember that the breeding of good or bad animals is no game of chance. You might as well expect to breed a superior Shorthorn beast by using an Alderney bull on a first-class Shorthorn cow as to breed a really good Southdown sheep by using an inferior ram on a good Southdown ewe.

If a man desire, and most flockmasters do desire, to breed good and shapely sheep, no matter what their breed may be, he must first endeavor to deserve success by going the right way to work to obtain it. Leave nothing to chance.

Many persons when they have hired a good ram try to get as much out of him as possible, and give him as many ewes as he can be got over. Now, I look upon this as an unwise thing to do. Nature has its limits; and it is far more judicious to limit the number of ewes put to a ram to from 50 to 70. The ewes will thus be seasoned at the proper time, and have strong, healthy, and vigorous lambs. If you overdo a ram and there are many ewes "run over," you will probably breed a number of weakly lambs, to say nothing as to the bad effect upon the ram for the following season.

I may observe that I by no means recommend what is commonly known as a "teaser" ram to show which ewes are in use. Nature never intended that such a course should be adopted, and I would impress upon you the necessity of following the laws of nature as closely as you can. When a ewe is taken from the teaser to the ram by which she is to be served there is frequently a great deal of nervous excitement and fear produced in the ewe, and this being so how can we wonder if there are many cases of ewes "running over," when they have been subjected to such unnatural treatment, which may be aggravated by the rough conduct of an irritable or bad-tempered shepherd.

PRACTICE AT MERTON.

I feel that I can best explain my views and recommendations if I allow myself once more to say a few words with respect to the system of management adopted in the Merton flock. In doing so I desire it to be clearly understood that though I have been con-

nected for so many years with Southdown sheep, and though I may be said to regard them with all the admiration felt for one's "first love," I am by no means disposed to praise them by depreciating other breeds. A long experience has taught me to recognize the fact that while Southdown sheep are well adapted to upland and dry soils, they are at the same time unsuited to some other soils and conditions. And when pointing out to you the great improvement that has taken place in the breeding of Southdown sheep during the present century, I am not unmindful of the marked change effected in other breeds, such as the Cotswolds, the Lincolns, the Oxfords, the Shropshires, and the Hampshires; and were it not for the invidiousness it would involve, I should like to stray from the immediate subject of my lecture to remind you of the honor which attaches to the names of the many breeders of these sheep, who have earned the thanks of both meat-producers and meat-consumers, but time will not permit this digression.

The Merton flock comprises twelve different families, and the shepherds know, from long experience, how to select the ewes for each family, which ram to put to them, and the kind of lambs that are likely to be produced. By this careful plan of managing the several families we have produced and maintained the large size of the Merton sheep. We have always remarked that when rams have been hired for use at Merton they have only in three instances given us a first-prize animal, but that the second and third generations, after an intermingling of fresh blood with our own sheep, have been most successful.

It is a rule at Merton that when a hired ram has left a promising ram lamb the lamb is used to eight or ten ewes to see how far he may be relied upon for use as a shearing, and thus the disappointment which might arise from his produce not being satisfactory is avoided.

FEEDING.

For ten days or a fortnight before rams are put with the ewes it is advisable to change the food of the ewes to something more stimulating than that which they had been previously fed upon. This not only causes the ewes to come into use more quickly than they would otherwise do, but invariably leads to a better fall of lambs. The fresh food must be continued for at least five or six weeks, when doubtless the greater part of the ewes will be seasoned.

MANAGEMENT OF FLOCK.

During pregnancy great care must be exercised not only in supplying the ewes with nutritious, health-giving food, but in keeping them from any great excitement; such, for instance, as might be produced by fright from being run by a reckless dog. I may here observe that, while fully recognizing the usefulness of a well-trained sheep dog, I cannot but protest against the way in which I have frequently seen in-lamb ewes and other sheep chased, harassed, and alarmed by a wretch of a dog, apparently under the slight control of a careless and lazy shepherd, who, to save his own legs, will unnecessarily run the dog after the sheep, heedless of the ill-effects it may produce. A good and careful man will not dream of doing such a thing. Many persons are little aware of the injury that is done by the injudicious use of dogs. If they are in-lamb ewes there is great risk of producing abortion, and if they are fattening sheep the effect of the alarm caused by an excitable dog upon them is to take a good deal more off in five minutes than you can put on again in five hours. In both cases the owner is a sufferer. The excitement caused by the action of the dog does away for a time with the quietude which is so desirable for fattening animals, and consequently they do not gain flesh so quickly as they would if they were kept free from unnecessary and preventable alarm.

The question what is the best course of feeding for in-lamb ewes is a most important one, and calls for the greatest consideration and care on the part of the flockmaster.

There exists no reasonable doubt that where ewes are kept on grass land until after they have lambed there is little fear of abortion, always presupposing that they are kept free from injury, are not jumped over ditches and water-courses, are not over-driven, nor subjected to fright, &c. I have proved beyond question, with the Merton ewes, that keeping them entirely away from turnips until after they have lambed is a decided safeguard against abortion. Up to the year 1853 the Merton ewes were folded on turnips from the end of October until the spring of the following year. They were then as unhealthy as any ewes in the country. In the early part of 1851 there were something like 110 cases of abortion, and 80 ewes died. Feeling that a change in the treatment must be made, I determined that in the future the ewes should not be fed on turnips (except for five or six weeks when the rams were with them) until after they had lambed. Since that time they have been folded and fed on grass land, with the supply of grass daily supplemented by a reasonable allowance of a mixture of hay chaff and fresh-made broad bran, at the rate of four bushels of chaff to one of bran. At about the fifteenth week of

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gestation half a bushel more bran is added to each four bushels of chaff, and this allowance of mixed food is gradually increased in proportion to the increasing demand made by the unborn lamb on the system and strength of the ewe.

HOW TO AVERT ABORTION.

Since the introduction of this change in our system of feeding the in-lamb ewes at Merton cases of abortion have been unknown, and the mortality among the ewes has been at a minimum. On this point I may be permitted to call your attention to my lecture on "Abortion and Mortality among Ewes," delivered in 1877. To enable me to arrive at something like a definite idea as to the cause of the fearfully large number of ewes which aborted and died in many parts of the country in the early part of the year I have referred to, I sent out more than four hundred circular letters of inquiry, each letter containing twenty questions, to flockmasters and others throughout the United Kingdom. These letters were almost all replied to, and the questions fully answered. They showed clearly and conclusively that the greater part of the abortions and deaths occurred in turnips where the ewes had been fed on a comparatively unstinted allowance of common turnips and swedes unmixed with dry food, and that a good allowance of dry food undoubtedly does away with many of the ill effects produced by simple root diet. It was also very clearly shown that where the ewes were grass-fed there was an entire absence given for the conclusions at which I arrived. The particulars, with the reasons I have alluded to, were fully detailed in the lecture to which entering further into this subject. Let me, however, add that I have every hope, when the system will be far more generally adopted, with as much benefit and advantage to flockmasters as to dairy farmers, cheese-makers, and stock-keepers in general. I am justified in this confident statement by my recent experience of the good results which have followed the use of ensilage in the case of in-lamb ewes. These results will be given to the public in the lecture which I hope to have the honor of delivering in this room on the 17th of March, on which occasion his Royal Highness the Prince of Wales has, with gracious condescension, expressed his willingness to preside.

LAMBING.

As the time draws near for ewes to lamb, a sheltered, well-littered yard should be provided. This should be surrounded by straw-thatched sheds, so divided as to have a nice comfortable pen for each ewe when she lams. These yards may be constructed for a comparatively small expenditure, and the cost will be amply compensated by the saving of life both among ewes and lambs; many that would otherwise probably be lost in severe weather being preserved by means of this timely protection. Suitable food and dry litter should also be provided close at hand, so that the shepherd has not to run about in search of these necessities at a time when the ewes are calling for all the attention which he can give them.

Bear in mind that the duties of a shepherd at lambing time are varied, trying, and anxious, and it is a "pennywise" practice to stint him. To deny him a fair and reasonable amount of manual help when he requires it will be hard upon him, and may be the cause of the death of many lambs; because, however willing he is, there is a limit to the shepherd's bodily power, besides which he cannot be in two or three places at the same time. A careful, painstaking shepherd, of the greatest value at any time, becomes doubly valuable at the laborious and anxious time of lambing. How considerable is the importance and worth of such a shepherd can only be fully understood and appreciated by those who, like myself, have watched his constant zeal and anxiety in endeavoring to do the best in his power for the interest of his employer. I repeat what I said on a former occasion, that it is very desirable for the master to visit his shepherd at the lambing-fold during the night as well as during the day, as frequently as possible, and especially in coarse weather, and if he occasionally takes with him something "warm and comforting" it will be gratefully received and fully appreciated. The more trustworthy the shepherd the better pleased he is to find the master taking an interest in his work. If everything is going on satisfactorily it will afford him pleasure to make it known to his employer, while on the other hand, if he is experiencing more than ordinary anxiety and difficulty in performing his duties, he will be very thankful for the advice and assistance that his master will be able to give him—more especially in cases where the shepherd has reason to put confidence in the skill and knowledge of the master. You therefore see how very necessary it is for you, agricultural students, to be well grounded in all the practical details of sheep management if you would become successful flockmasters, or desire to have your shepherds look up to you for advice.

STRAINING IN EWES AFTER LAMBING.

In a lecture on the "Diseases of sheep," delivered in November, 1872, I referred to most of the diseases to which sheep are liable. On this occasion I can refer to one or two only. There is that fatal disorder, "straining in ewes after lambing," as to which I may say that in the spring of 1878 I made known the success which had followed the treatment of ewes when affected with this disease by the use of carbolized oils, by which an enormous amount of suffering and loss amongst ewes is prevented. Not only did the Merton shepherd save every one of the ewes thus afflicted when we first adopted this treatment, but the flock in the last few years has been entirely free from the disease, which I think is wholly attributable to the free application of the carbolized oils whenever a case of difficult lambing has arisen. Since this treatment was made known by me through the agricultural papers it has been tried by many flockmasters, and with almost unvarying success.

One of the leading physicians of Norwich, and at the present time mayor of that city (Dr. Eade), was so struck with the success of the treatment that he tried it in two out of five severe and dangerous cases of puerperal fever in women. The two patients so treated recovered; the other three died. These cases, most interesting and important (from many points of view), will be found reported in the *British Medical Journal* of January 22, 1881, p. 116, in a paper contributed by Dr. Eade. It would take too much time to enter into the particulars of this fatal disease and the method of its treatment. For information on these points I would refer you to some correspondence on the subject published by the proprietors of the *Norwich Mercury*, at whose office copies may be obtained. There you will find full directions for the preparation and use of these carbolized oils. The utmost care must be taken in preparing the oils, which should be compounded of the best ingredients. Failure here may lead to failure in result. Indeed, such is the care required in the preparation that (though no doubt there are others) I myself know only of one or two firms in England whose oils are perfectly satisfactory.

TREATMENT OF EWES IN LAMBING.

A few brief general directions as to the management of ewes during lambing time may be of future service to you.

In the first place the shepherd should make it his practice to quietly walk among the ewes, carefully noting those which show symptoms of lambing within a few hours, and gently driving all such into a sheltered fold near the lambing yard, or into the yard itself, so that, whether day or night, he will know where chiefly to direct his attention. When the labor pains come on, and the lamb is believed to be in the right position, the shepherd should not be in a hurry, but allow nature (the best of all midwives) to do her own work. An experienced shepherd will never attempt to help a ewe until he sees that there are signs of her (to use a shepherd's term) "giving up." Then assistance may be rendered with advantage.

The lamb when born should be placed near the head of the mother who, as a rule, will perform her natural duty. When the ewe has done what is necessary by the lamb, and has somewhat recovered from the fatigue and exhaustion of the labor, she should be sparingly fed; at first with a mixture of good hay, chaff, bran, and crushed heavy oats. Let it ever be remembered that the more judiciously and generously a ewe is fed after having fully recovered from the lambing the better she will be able to nurse the lamb. When the lambs are old enough to pick or nibble a few turnip tops, or a little young grass, they should be allowed to run into a forward fold, where, after a little time, some finely-crushed linseed cake, mixed with crushed heavy oats and a small quantity of fresh bran, should be placed in low, covered troughs, so that they may eat a little of the mixed food at pleasure. This kind of feeding should be continued, increasing the allowance of mixed food as the lambs grow older and stronger. Of course experienced shepherds or flockmasters will understand that it is desirable later on to throw out a few mangolds which the lambs can pick over in the forward fold, the ewes taking what the lambs leave. Perhaps it is unnecessary I should say that it is desirable for the mangolds to be somewhat withered by exposure to the sun and air before they are thus given to the ewes and lambs. I know of no mangold so well suited for early feeding by ewes and lambs as Sutton & Sons' "Yellow Intermediate." We are so satisfied with it that we now grow no other variety. When the time arrives for weaning the lambs, which will be about the 1st of July, preparations should be made to have a supply of coleseed or cabbages, or a similar kind of food, to feed them upon at night, and during the day they should be run out on clean, fresh grass; but on no account allow them to feed on grass growing upon land which may have been fouled by being heavily sheep-fed. Grass growing on such land is pernicious to lambs, and should be carefully avoided. The evil effect may not be observed until much harm has been done. The lambs should have a daily allow-

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ance of from three to four ounces per head of mixed bruised heavy oats, linseed cake, and fresh broad bran. Where it can be conveniently given, a frequent change of pasture is most desirable, and any extra trouble or inconvenience this may cause will be amply repaid by the thriving and healthy condition that it will be sure to promote. The ewes will require extra care and attention when the lambs are weaned from them. For a few days they should be somewhat sparingly fed, so as to check the production of milk. Each one must also be specially watched to ascertain the condition of its udder, and, when necessary, it should be relieved of any excess of milk by carefully drawing it off with the hand. A neglected udder is frequently followed by milk garget, which is invariably troublesome disease. It arises from the milk curdling, and gives considerable pain and inconvenience to the ewe. The first thing to do is to get all the milk possible from the udder. Then use rather freely a lotion consisting of sugar of lead, $\frac{1}{2}$ ounce; sulphate of zinc, $\frac{1}{2}$ ounce; vinegar, 1 pint; water, $\frac{1}{2}$ pint. And give a dose of Epsom salts of from 3 to 4 ounces, dissolved with warm water.

Practical flockmasters are also well aware that great care and attention are required in the management of lambs throughout the months of July, August, and September, when so many thousands are annually lost from a low, lingering, weakening fever, which seems to feed on their very life's blood, *post-mortem* examinations showing that it leaves an emaciated body, white and bloodless. A cure is most difficult, and is rarely accomplished, if the fever remains unchecked for any length of time. Prevention in this, as in other matters, is far easier and therefore better than cure. My experience convinces me that injudicious and niggardly feeling is the main cause of this lamb disease. Where lambs are given a change of food of a nutritive character, and are not allowed to feed on pastures or layers where sheep have been folded or have laid thickly on the ground they generally remain healthy, and are seldom attacked with the fever. "Keep lambs in a thriving condition" is a rule which ought to be written in letters of gold. It is a rule which also applies to sheep of all ages. Time passes so quickly that I have only a few minutes to speak of the management of young sheep when first fed with turnips. I may, however, briefly observe that great care should be taken to gradually accustom the hoggets to turnips by throwing a few at a time on to grass land where they are feeding, increasing the daily allowance as they get accustomed to the food. When this has been accomplished put them into a fold on the turnip land at night; in that case, also, the supply of roots must be limited for a time. When feeding young sheep on turnip land it is of the first importance not to pinch them with insufficient hurdle room. An extra £10 expended in hurdles may save the loss of £20 worth of sheep. A good supply of hurdles enables the animals to get exercise, and to pick up any withered parts of turnips which may have been passed over during the folding. Such withered roots are enjoyed by sheep when the weather is fine, and frequently have a good effect in checking any possible evil from the fresh turnips.

It should be borne in mind that good and successful managers supplement the turnip food with a mixture of chaff (if of hay all the better), malt, culms, bran, and linseed cake, and are guided in the daily allowance by the time at which they wish to have the sheep ready for sale. When the period comes to feed with swedes, in place of white or other common turnips, care must be taken to introduce them mixed at first, and then gradually to increase the proportion of swedes until no turnips are given at all, and then overdo them with roots at any time, or bad results may follow. It sometimes happens that under any circumstances a lot of sheep will begin to do badly on roots. When this is the case do not hesitate to entirely change the food for a time. It will avoid disastrous loss. I have frequently known a judicious alteration of food cause so great a change in the health of a lot of sheep as to surprise their owner and the shepherd in charge of them. A careful, observant, and practical man will frequently avoid the losses which another person, less observant and less practical, is called upon to endure.

DISCUSSION.

Lord Walsingham, who was warmly cheered, said: Professor Tanner having at the last moment very unexpectedly done me the honor to ask me to take the chair on this occasion, it becomes my duty and gives me great pleasure to propose a vote of thanks to Mr. Woods for his most excellent lecture. I may honestly say that no one has had more opportunity of judging of Mr. Woods's intimate acquaintance with the subject on which he has just spoken than I have myself. I am indebted to him personally for his most excellent management of my flock of Southdown sheep. But apart from that his contributions to agricultural literature are known and valued. I believe that his first lecture, which he gave to the Wayland Agricultural Association thirteen years ago, is still of the greatest possible use to the flockmaster. Mr. Woods has referred in flattering terms to the late Mr. Jonas Webb. I have no doubt that many of you are well acquainted with the statue

of that gentleman which stands in the market-place of Cambridge, and bears testimony to the high reputation in which he was held as an agriculturist and a breeder of sheep. I think we shall all agree that Mr. Webb contributed very much to the improvement of our mutton and wool, and I am quite sure that it will be also your verdict that Mr. Woods has done his duty during his life in contributing to the same satisfactory result.

Professor Tanner: I have great pleasure in supporting the remarks which have fallen from Lord Walsingham. In reference to the lectures of Mr. Woods, which have been published, I am quite sure that they are looked upon as treasures amongst agricultural literature, embodying, as they have done, great personal experience and great personal judgment; and I have no doubt that those of us who will have the pleasure of hearing him on the 17th of March will find that in reference to another subject which is now taking a prominent position in practical agriculture he will be well to the front. I have, therefore, great pleasure in supporting the vote of thanks to Mr. Woods for his very able lecture on this occasion.

Mr. Woods, who was received with renewed cheers, said: I am extremely obliged to the noble lord for another of the very many and great kindnesses which he is always showing me in speaking so flatteringly and kindly of me as he has done this evening. I am very glad to have had the opportunity of making known to you something of the practice of management of Southdown sheep at Merton, and if it proves of any advantage, I wish success—I shall be greatly gratified. Let me also say, having had the management of the Merton sheep for such a great number of years, that it would have been a very heavy weight of labor upon my hands if I had not been so thoroughly and practically assisted by the advice of the noble owner of that flock, who, it is a great gratification to me, has attended here to-night to hear what I have had to say about his own property.

Mr. Henry Webb proposed a vote of thanks to Lord Walsingham for presiding, and observed that the noble lord thoroughly deserved the success that he had attained with his celebrated flock.

Mr. Biddell, M. P., seconded the vote of thanks with great pleasure. He said he could not help feeling that agriculturists were greatly indebted to his lordship and to his first-rate agricultural adviser. Where they had great practical talent and scientific attainments, combined with wealth, and the owner of that wealth ever ready to spend on behalf of agricultural advancement, they could not be too grateful for the advantages they derived therefrom. Speaking from a long experience, he advised young farmers to disabuse their minds of the idea that there was nothing like weight for getting a large price for their sheep. Small sheep would often bring more profit than large sheep, because they would make mutton in proportion to their food much faster, and when it was made the butcher would tell them that it was much more salable than large mutton. He hoped to live to see the day when Southdown flocks would again be the most fashionable.

The noble chairman, in reply, said: I thank you very much for your great kindness towards me, and for the very flattering terms in which the proposer and seconder of this vote of thanks have been good enough to speak of me. I always take the greatest possible interest in all questions relating to agriculture. This is very much owing to my friend, Mr. Woods, for I am afraid without him my interest in agriculture would have been very much handicapped. If I had been called upon to begin a course of farming and get up a flock of sheep at a time when, as in late years, agriculture has not been in the most prosperous condition, I might have disheartened, and said that I would not take much trouble about it; but coming into the property I did, with a flock already established, with able managers in charge of that flock, and with everything in my favor, it was impossible for me not to take the liveliest interest not only in the pursuit of agriculture but also in the flock of sheep which I found upon the Merton estate. With regard to the size of sheep, the point alluded to by Mr. Biddell, I quite agree with him that a small sheep often means more profit to the owner than a large one. Small mutton is, no doubt, in great demand in London, and small sheep will fetch higher prices in proportion to large sheep; but, at the same time, if you can increase size without losing quality, I hold that should be the object which we should have in view.

[Inclosure No.

The history of Babraham farm, which has been in the hands of the same family for over 400 years, is a very interesting one. The farm was first brought into the hands of the present owner, Mr. Biddell, in 1840, and since that time it has been the scene of many improvements. The farm is situated in the parish of St. Andrew, near the village of Babraham, and is one of the most fertile in the county. The soil is a rich, deep, brown loam, and the climate is very healthy. The farm is divided into several fields, and is surrounded by a high stone wall. The buildings are all of stone, and are in a very good state of repair. The farm is a very fine example of a well-managed estate, and it is a pleasure to visit it.

The young and judgment. He experimented with a view to the improvement of the breed. If that was the case, the question from the stand then, and that the great improvement in the Cotswolds will grow out of food than small. It referred to a of fancy price. The question the food consumed. It is true that this time; on ewes. But y After the season Southdown b

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SOUTHDOWNS AND CAMBRIDGESHIRE FARMING.

[Inclosure No. 4 in Consul-General Merritt's Report—Reprinted from the Field, August 18, 1883.]

The history of the Babraham flock is the history of modern Southdowns; and the Babraham flock originated in this way. The late Mr. Jonas Webb's father was a leading farmer of his day, and when his sons were grown to manhood, and he was getting into years, he spoke to them to this effect: "There ought to be some experiments tried with different kinds of sheep. But that is young men's business. I am too old to begin now; you make the experiments." His son Jonas entered fully into the spirit of the suggestion, and, having hired the Babraham farm, he subsequently began such trials as suggested themselves to him. Leicesters were the fashionable breed of that day, as was then shown by this breed being first on the list of the classes shown at the Smithfield Club Christmas shows. They still, it need hardly be said, hold this "pride of place" at the London shows to this day. And not only so; for when the Royal Agricultural Society of England was inaugurated at Oxford in 1859, the Leicesters stood first in the list of classes for sheep. They were given the same position at the recent York show.

The young Jonas Webb, of some sixty years ago, displayed at starting the sagacity and judgment which ultimately led to his being the greatest agriculturist of his age. He experimented with Leicesters, Southdowns, and other breeds of sheep, side by side, with a view to ascertain which would produce the most meat and money value per acre. If that was not a stroke of genius at that time, it was the correct way of looking at the question from a practical point of view. Young Jonas Webb evidently clearly understood that the greater individual weights at a given age of such large sheep as Lincolns and Cotswolds yield the most profit on the food a farmer may have at his disposal. Nothing will grow out of nothing; and a large, coarse, bony-framed sheep naturally requires more food than smaller and more compact ones. It was this consideration that made the test referred to a question of so much mutton and money per acre. This was before the days of fancy prices, as now given by rich amateur breeders at home and by foreign millionaires. The question then was closely limited to the value of mutton and wool, according to the food consumed, as between the breeder or producer and the butcher or consumer. It is true there were some high figures given for "New Leicesters" of Bakewell about this time; one Leicester ram was let for a thousand guineas to three owners of Leicester ewes. But young Jonas Webb clearly did not heed this and lesser tempting prospects. After the several experiments he instituted and carried out he settled down to the Southdown breed.

Having come to this decision, young Jonas Webb then brought his great natural judgment to bear in improving his flock. The result of his judgment and skill in matching his males and females culminated at the Royal Society's show at Canterbury in 1860, when he took easily the six prizes offered for rams, first, second, and third for shearlings, and first, second, and third in the class for older sheep. A well-executed oil painting of these sheep, with John Day (now of Merton) among them, crook in hand, hangs in the dining-room of Jonas Webb's eldest son, Mr. Henry Webb, of Streety Hall, near Linton. The artist was the well-known animal painter of his day, Mr. W. H. Davis. Mr. Jonas Webb had resolved not to exhibit his sheep after the Canterbury meeting, and his success there, as above mentioned, was a well-merited finale to a long career of successful breeding and exhibiting.

Not so, however, as an agriculturist. For some years previously Mr. Webb had started a herd of Shorthorns, and at the Battersea show of the Royal in 1862 he sent First Fruits, a white bull calf, which was in the most blooming condition that I had ever seen an animal up to that time. For First Fruits (appropriately named, as this was the first Shorthorn he exhibited) he easily won the first prize. Then in the same year came his lamented death, at the age of sixty-six. But the honors he had won as an agriculturist did not end with his decease, for he had so gained the confidence and respect of all the leading agriculturists of the kingdom that a statue to his memory was subscribed for, and cast. This was the first honor of its kind that was ever conferred for purely agricultural eminence. This statue now stands in the market hall of his native market-town of Cambridge, six miles from Babraham.

These recollections were revived last week by an unlooked-for visit to Streetly Hall, Linton. As Mr. Henry Webb, the eldest son of his celebrated father, has never exhibited his sheep at the Royal and other shows, and as no prominence has been given to them in agricultural journals, I was quite surprised to find the descendants of the original Babraham stock of Southdowns displaying all the purity, good form, fine quality, and good size of their ancestors, with which I was well acquainted twenty-five years ago. The Babraham stock, so far as I have been concerned, had dropped entirely out of sight. Not so, however, with the leading breeders and prize-winners at Royal and other shows, as will be seen shortly.

Mr. Henry Webb hired Streetly Hall (which is about six miles from Babraham) four years before the death of his father. He continued to superintend his father's flock, so far as seeing to his entry of pedigrees and the matching of males and females went, and during this time he had the pick of the best of such sheep and lambs as his father could spare. Then at the sale at Babraham, in 1861, he bought eighty of the aged ewes, the full character of which, both in regard to their breeding capacity and pedigree, he well knew. He also bought eight rams of suitable relationship to the ewes he then purchased and previously possessed at Streetly Hall. It was in this way his present flock was founded, and it may as well be said at once that not a single sheep of other stock has since been introduced to the Babraham flock. This close in-and-in breeding has, of course, required great and good judgment, as well as an intimate knowledge of the complete record of relationship which has been kept. All this has been displayed in a masterly way by Mr. Henry Webb, as evidently by the prolific character and uniform appearance of his present flock.

Streetly Hall, five miles northeast of Linton, is an occupation of 550 acres, 40 acres only of which are pasture. This farm has been in the Webb family for four generations, or upwards of a hundred and fifty years. Its soil is all of a tenacious character, the subsoil being either pure clay or a chalky marl. Some specially skilled management and cropping is therefore required to make it suitable for the health and progress of a large flock of sheep.

The breeding ewes kept number from two hundred and thirty to two hundred and fifty, according as season may vary, or the demand by foreign customers may be more or less. Some aged or barren ewes are drafted from the main flock yearly, and these are replaced by the required number of the best shearlings. As to the health of the sheep, the greatest possible care is taken to avoid contagious diseases. The fences by roadsides are hurdled off, and the gates by roadsides are fenced off by squares or semicircular loops or hurdles, so that the sheep may not come in contact with any passing stock. If sheep or cattle are seen to pass along the road—and the shepherd is always on the lookout for this—the passage along the same road of the Streetly Hall flock is not allowed for at least seven days, no matter what the inconvenience and extra expense may be. This may be looked upon by some stock-keepers as an overdrawn precaution, but this great care is justified by the fact that while diseases have existed in the neighborhood and close at hand, the Streetly Hall flock has never been attacked in any form. As an instance of the healthy and prolific character of this flock—its close consanguinity notwithstanding—every ewe but one that was put to a ram last year had a lamb this spring.

The mode of registering the pedigree of each strain of the flock is to mark the ears of the lambs in a given way before they are weaned. Then the dams—which, of course, have had their ear-marks since they were lambs—are dotted with paint on the near or off shoulder, or on the side or rump, each mark indicating that she was by a certain ram, or had some other close relationship to other rams. These signs are all recorded in the flock-book, and when the time for matching rams and ewes in the autumn arrives, it is to be seen at a glance (by any one like Mr. Henry Webb, who is used to it) which ewes and rams are closely related, and which are further removed in relationship. This skilled and accurate system necessitates the use of eight or ten rams every year for the two hundred and thirty to two hundred and fifty ewes. Sometimes ten ewes of one strain may be suitable for one ram of another strain. In other cases, twenty, thirty, or fifty ewes of other strains may be suitable for other rams. The best rams of particular strains that are suitable for a given number of the ewes of the current flock are valued beyond price; for no consideration would they be sold. An instance of this occurred recently. A Frenchman (one of the leading breeders of Southdowns in France) came over, as usual, to buy, and he showed his good judgment by specially admiring a particular sheep; but he was peremptorily told that he was not for sale, as he was required for so many ewes at home. This, however, did not pacify monsieur, for he went back the next day and said, "I was thinking about No. — all last evening, and dreaming about him all night, and you must let me have him." But, as I have said, a specially good sheep of a given strain is reckoned by Mr. Henry Webb as being beyond price, and he had appointed him for use this year with so many ewes, and no tempting offer could cause him to depart from his resolve. This is how the fine character of the Babraham

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stock has been preserved at Streetly Hall. These best sheep, however, are let to other breeders of pure Southdowns, to be delivered at a date when they have done the little work required of them at home. Thus they may be used two or three seasons, or as long as they may be required at Streetly Hall, when they are sold to other breeders, foreign or English.

As an instance of the way this plan has been carried out, it may be mentioned that the first-prize shearing at Canterbury, as represented in the painted group of six above referred to, was used at Babraham in 1860, when he was subsequently sold for 250 guineas to Mr. Thorn, of Thorndale, Washington Hollow, Dutchess County, New York. The strain of this sheep is now strongly marked at Streetly Hall. When his stock came out as yearlings, all the leading breeders of Southdowns in England availed themselves of the use of his sons, and a large measure of the fine character of their present flocks is due to the impression made by Archbishop on his issue. The Derby strain (so named after the first-prize shearing at the first Royal meeting at Derby) is another line of sheep that is now conspicuous. There are three grand shearlings of his descent allotted for use at home this year. It was about one of these that the French breeder thought and dreamed so much. The ewes with a paint spot on the off hip are of this Derby strain. This shows the importance of these marks and a record of them. It need hardly be said that the male descendants of Derby will not be matched with the females of that strain, but a ram will be chosen for them which is the furthest removed from that line of descent. It may be that an Archbishop or a Peregrin line may be from that line of descent. But in this I am only guessing by way of a general illustration, although these entries are A B C to Mr. Henry Webb, who has grown into familiarity with them from boyhood upwards.

The younger animals of this flock are remarkable for their size and uniformity of frame and color. There are one hundred and twenty yearling ewes. Of these seventy will be selected for strengthening the main flock. These seventy, when put together, might be run promiscuously into lots of five or ten each; and he would be a fastidious, not to say an affected judge, who would have confidence enough to declare which was the better pen of the lot, so alike are they in general character. The less perfect fifty will be sold to French, Canadian, American, or other foreign breeders, who are glad to buy at high figures any number that can be spared from the Babraham stock. Frenchmen in particular are eager customers, from the recollection they have of the great success of the late Mr. Jonas Webb at the Paris International Exhibition in 1867.

The rams are eighty, most of which are shearlings. Rams do not grow to so much uniformity of size and general character as ewes do, particularly when a large proportion is left for stock. But, even with this large number, there is the unmistakable family stamp and likeness to be seen in the meanest sheep. There is, besides, a regular and good demand for the smaller and less evenly-balanced rams for crossing purposes, as it is well known that animals are often as much like their aunts and uncles as they are like their parents; and therefore, by the same rule, a comparatively inferior-looking sheep—stock purposes as his more perfect relative would be. On this ground Mr. Henry Webb saves the large number indicated of his males, for which he has, as intimated, a regular and good demand. But—and this is not singular, as the renowned character of the Babraham stock causes it to be still resorted to by the principal breeders of Southdowns to keep their flocks up to a high standard—there is more difficulty in bargaining for £10 or £12 rams than for such as run into three figures. English farmers, who breed and feed for a direct profit over the scales, look at an extra shilling per lamb, from an extra cost of £2 or £3 for their sire, with suspicion or distrust; but they overlook the fact that when a pure-bred ram from an old-established flock is put to a flock of common ewes, be they of the same or of a different breed, the issue “shoot out and grow” to a far greater size than they will do if they be issue of common or mongrel parents on both sides. These lesser-priced rams are therefore generally sold to go abroad to France, America, Canada, and other foreign and colonial parts. Their character being so well known and appreciated by the customers of Mr. Henry Webb, all the bargaining now consists in an order by letter for so many at the understood price. Peregrin, I forgot to mention, whose issue are now marked with a paint spot on the near shoulder, was used among a prize-winning flock last year, and he has since been sold at a good figure to a leading French breeder of Southdowns. Hardihood (No. 10), too, is the son of a grand ewe of a favorite lineage, and she is well-woolled down to her jaws and hoofs. Hardihood is by No. 3, a four-year-old of well-preserved form, as he is nearly as straight as a shearing, although his grand character has led to much work being got from him.

The lambs are simply living pictures, both rams and ewes. As the whole crop of each sex is together, there are, of course, variations in form and size. But, as to their general character, there are very few under-sized ones. And as to their family traits, it may be

fairly said they are all alike, "as peas in a bushel are alike." When I just previously mentioned that the dam of Hardihood had wool down to her jaws and hoofs, I did not wish it to be inferred that her fullness of fleece was exceptional; for this characteristic of these descendants of the Babraham stock is general. The lambs, both male and female, are remarkable for the way they are furnished with thick, fine wool over the poll, on the jaws, and down the legs.

Before I make a few notes about the mode of cropping Streetly Hall, I will just mention that I saw the entry in the Babraham catalogue of 1855, of the letting of Young Elegance, the sheep which caused so much discussion among breeders of Shropshires and their critics, from twenty to twenty-five years ago. He was hired in the above year at 131 guineas for use among the Kinver Hill flock, where he was accordingly used. The same year the Duke of Richmond hired a ram—afterward named The Duke—at 170 guineas.

The cropping of Streetly Hall is made subservient, to a great extent, to the large and valuable flock of sheep kept on the farm. The four-course system is mainly pursued. The cereals need not be referred to in this place, further than to say that the green crops and other food prepared for and given to the flock tell greatly on them in a favorable season. This year the spring and summer, so far, having been more favorable than for several past seasons, the crops are generally heavy, and the wheat, oats, and barley have a very fruitful appearance. Some of the wheat-fields have patches of a dark appearance in them; but this is due to the excessive wet in the autumn having killed some of the plants, the said dark appearance being due to the plants having tillered in the spring from having had too much room. Mildew is there apparent, and threatened to be more injurious, owing to recent wet and absence of sun. This is only another instance of the folly of thin seeding, which was talked so much of and written so much about some years ago.

Green crops of almost all kinds are grown for the convenience and support of the flock. Sainfoin is a favorite variety, and it grows freely on the clay which rests on a chalky or marly subsoil. This year, owing to the free growth of tares, ryegrass, and clovers in April and May, several acres of sainfoin have been saved for seed, and from the way the stems are heavily laden, it is expected that eight or nine sacks per acre in the husk will be yielded. Mr. Webb does not approve of the extra labor of "drawing" this seed; that is, of scrubbing off the husk, as he says—which is clearly evident—that it is unnecessary; so he sows it with the husk on, and sells what he has to spare in the same condition.

The swedes, mangolds, and early turnips are grown on ridges a yard apart, that a perfect tilth may be made while the crops are growing, which is clearly, as explained, a necessary point in farming strong land. The plants in the rows are generally left with a short space between them, but this is varied according to the nature of the plants. The later white turnips are sown on the flat, and a Garrett's horse-hoe is used for cleaning them. The Norfolk plan of leaving three white turnips in a bunch, when they are required for late spring feed, is here pursued. This is because they are found to withstand the effect of winter frosts better when three are close together; they, so growing, yield to the swelling of the soil at the time of its being frozen, by rising from the inner or to the swelling of the soil, whereby the roots are only slightly stretched, the cellular touching side of each turnip, whereby the roots are only slightly stretched, the cellular tissue not being broken, as it is when the swelling soil presses all round a single turnip. Neither mangold nor kohlrabi grow freely on this peculiar clay soil; so the latter are not cultivated, and swedes are sown with the mangold, the latter being drawn out, and the swedes left for feeding on the land. This peculiarity as regards mangold is now evident, for the swedes are strong and well grown, and their bulbs much larger than the bottoms of the mangolds.

A few Prussian blue peas are grown—a dressing of 5 cwt. of blood manure per acre being applied—in the place of roots, as this soil is admirably adapted for them. They are also generally grown to a small extent in the neighborhood. I heard of a case of 9 quarters to the acre having been grown. Mr. Webb's plant was 30 inches long, and very heavily hung with large and full pods. After the peas are harvested, rape and mustard, or late turnips, are sown, according as it may be expected the feed will be more required in the autumn or spring.

Italian ryegrass is sown in wheat for early spring feed. On this mangolds are thrown for the ewes, with a view to make the ryegrass last for the lambs till the clovers are ready. The soil is, of course, greatly increased in fertility by this plan. Turnips are sown afterwards, sometimes on one deep furrow and a scarifying, or after three plowings, according as the season and the other work of the farm may allow.

The flock, in suitable divisions, is now being folded on white clover and lucern. The lambs and ewes are folded on a fine second growth of white or Dutch clover. The ram and ewe lambs are of course divided, they taking the lead in the folds, the ewes following, one day after the male lambs, the next after the females. There is a good supply of last

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year's mangolds remaining, and will apparently be for a month. These are yet in excellent condition, and two or three tons a day are thrown into the fold, the lambs eating them freely, and, owing to the ripeness of the roots, they thrive admirably on them, showing no signs of scouring. A large square of compressed white salt is in a box in every fold. Mr. Webb prefers the refined blocks to rock salt, as the sheep take more of it. They certainly nibble it off, or scoop it off in large quantities, with an evident relish. Ensilage in an incipient form, as compared with the knowledge we now have of this practice, has been long in use at Streetly Hall, and it is still continued with the success which has previously attended the system. The sweetest straw of the farm is cut into chaff by one of Maynard's riddling machines, and it is still continued with the barn, mixed with as much cut green tares, clover, or grass as will cause it to heat to a degree of temperature of a well-secured haystack. When the autumn filling of a bay tares, ryegrass, or lucern is fit for the scythe, a small quantity of mangolds is used to generate the required heat for giving a relish to the straw chaff. The layers of this chaff and its fermenting accompaniment are liberally sprinkled with salt while it is being well trodden down by the men who level it.

These points of Mr. Webb's practice clearly seem to be worthy of general consideration.

W. W. G.

The flock of ewes consists of about 300, after about 70 yearlings are put in annually.

H. W.

FRENCH SHEEP.

NOTE BY MR. H. KAINS-JACKSON, OF THE PARIS SHOW, 1883-'84.

[Inclosure No. 5 in Consul-General Merritt's report.]

To most English breeders these would be disappointing, as they formed but a light contingent and ragged regiment in comparison with our Cotswolds, Lincoln, Shropshire, and Downs sheep; whilst their being exhibited out of the wool, and many of the best clothed up like greyhounds, gave a very forlorn appearance to the pens.

The breeds of France are headed by the Merino and mixed Merino varieties, said to be the most widely distributed of any over the globe, and these came direct from Spain at the close of the last century. A good Merino often has wool, fine, soft, and elastic, from the tip of the nose down to the feet. The chief flocks are called after their districts—Soissonnais, Chatillonnais, Beauce, Champagne. Native French breeds crossed by Merino rams have been greatly improved, and are called Métis-Merinos. The cross of our New Leicester or Dishley breed with Merinos has made Dishley-Merinos great favorites in France, especially in the Beauce district and the departments of Berry and Sologne. The French long-wooled breeds are called Artesienne, Normandy, Picardy, Flemish, Saintongeaise, and Vendéenne, and have long legs, long falling ears, thighs and legs devoid of covering, and coarse, long, pointed wool on their backs. All are representative of the Flemish breed, which has the good quality of fattening easily and cheaply. Crossing with the Dishley or New Kent rams, the stock is improved much from its former meagerness.

In the great central sheep-breeding provinces of Berry and Sologne are hardy low-land breeds—the Berrichon and Solognot; but the wool is hard, dry, and scanty—head, belly, thighs, and legs being bare—and the size is often small; the ears are broad and hang backwards, and the whole animal is the antithesis to an English fat sheep. But the flesh is delicate, and the breed fattens well. The Sologne sheep attract notice by their coffee-colored heads and legs.

The mountains have local breeds of small size, compact trunk, thick, hornless head, and well-flavored meat. The chief are the Larzac, Lauraquais, Causse, and Segala varieties, and they are found in the southern departments, giving much milk, that is made into cheese. The first named produces the celebrated Roquefort cheese. English Downs sheep have made many cross and valuable varieties in France, and our New Kent and Berrichon have created what is now often spoken of as the distinct Charmoise breed.

At the show held last February, 1884, the prize group of sheep were Southdowns, bred in the Nièvre by M. Colus, and the lot of 15 were an excellent group, and would take a good place at an English show, probably gaining second or third prizes. The next breeds that gained notice were the Leicesters (Dishley), Southdown-Berrichons, and pure Berrichons, and Artesiennes. The pure and cross-bred Merinos always occupy front rank. The Oxfordshire Downs cross with the French breeds is much esteemed. In 1883 the prize group was of the Merino breed. French breeds of sheep cannot be recommended for export.

H. KAINS-JACKSON.

WEIGHTS OF SHEEP AT ISLINGTON.

Enclosure No. 6 in Consul-General Merritt's report. From the Mark Lane Express of December 24, 1884.]

TABLE 1.—Age in days, weight, and average gain per day of the several animals, taking the classes as they stand in the catalogue, with the exception of those for ewes.

Description.	No.	Exhibitor's name.	Honors.	Age.	Weight.		Daily gain.
					Days.	Pounds.	
Class 36.—Fat wethersheep of the Leicester breed above 12 and under 24 months old.	215	Mrs. S. P. Herrick	Second	614	242	0.39	
	216	do.	Cup, first	614	248	0.40	
	217	Executors late B. Painter.		614	255	0.42	
	218	do.		614	252	0.38	
	222	Mrs. S. P. Herrick	First	254	134	0.53	
Class 38.—Fat wether lambs of the Leicester breed under 12 months old.	223	do.		254	131	0.52	
	224	Executors late B. Painter.		254	129	0.51	
	225	do.	Second	254	122	0.48	
	226	T. and S. G. Gillett	First	630	292	0.47	
	227	do.	Second	644	271	0.42	
Class 39.—Fat wether sheep of the Cotswold breed above 12 and under 24 months old.	228	J. H. Elwes	Third	630	311	0.41	
	229	T. R. Hulbert		630	260	0.43	
	230	G. W. G. Thomas		630	274	0.45	
	234	T. and S. G. Gillett	Second	294	188	0.66	
	235	J. H. Elwes	Cup, first	300	201	0.67	
Class 41.—Fat wether lambs of the Cotswold breed under 12 months old.	236	T. R. Hulbert		240	149	0.62	
	237	G. W. G. Thomas		270	168	0.62	
	238	Thomas Gunnell		660	277	0.42	
	239	Robert Wright	First	630	292	0.46	
	240	John Pears	Second	630	280	0.44	
Class 42.—Fat wether sheep of the Lincoln breed above 12 and under 24 months old.	245	Herbert Mackinder	First	270	179	0.66	
	246	do.	Second	284	189	0.67	
	247	H. M. Kirkham	Third	291	179	0.63	
	248	Thomas Gunnell		300	192	0.64	
	249	do.		300	173	0.58	
Class 44.—Fat wether lambs of the Lincoln breed under 12 months old.	250	A. J. Whitche		270	172	0.64	
	251	Thomas Wotten		667	243	0.40	
	252	Henry Page	First	600	264	0.44	
	253	do.	Second	600	246	0.41	
	254	B. W. Tassell		600	254	0.42	
Class 45.—Fat wether sheep of the Kentish or Romney Marsh breed above 12 and under 24 months old.	255	Fred Neame, Jr.		630	239	0.41	
	259	Henry Page	R.	240	160	0.67	
	260	do.	Cup, first	240	179	0.75	
	261	H. R. H. Prince of Wales.		630	203	0.32	
	262	do.		630	213	0.34	
Class 47.—Fat wether lambs of the Southdown breed above 12 and under 24 months old.	263	Duke of Richmond and Gordon		630	206	0.33	
	264	Sir John Kelk		630	221	0.35	
	265	Lord Alington		630	214	0.34	
	266	do.		630	215	0.34	
	267	The executors of H. H. Penfold.	R.	630	234	0.37	
Class 49.—Fat wether sheep of the Southdown breed above 12 and under 24 months old.	268	Lord Walsingham	Cup, first	614	251	0.41	
	269	do.	Second	614	230	0.37	
	270	Duke of Hamilton		630	208	0.33	
	271	Earl of Onslow		644	217	0.34	
	272	Lord Braybrook		630	210	0.33	
Class 50.—Fat wether lambs of the Southdown breed under 12 months old.	273	G. C. Carew-Gibson		630	209	0.33	
	275	Charles Chapman	Third	600	204	0.34	
	285	Earl of Suffolk		600	160	0.59	
	286	do.	R.	270	147	0.54	
	287	Henry Upton		307	162	0.55	
Class 51.—Fat wether sheep of the Hampshire or Wiltshire Down breed above 12 and under 24 months old.	288	do.	Second	307	163	0.53	
	289	Alfred Heasman		284	151	0.53	
	290	do.		284	136	0.48	
	291	J. J. Colman, M.P.	First	270	131	0.49	
	292	William Toop		270	155	0.57	
Class 53.—Fat wether lambs of the Hampshire or Wiltshire Down Breed under 12 months old.	293	do.		284	153	0.54	
	294	Sir John Kelk		644	294	0.46	
	295	Sir C. M. Sampson	R.	644	279	0.43	
	297	Alfred Morrison	First	674	319	0.47	
	298	do.	Third	660	277	0.42	
Class 55.—Fat wether lambs of the Hampshire or Wiltshire Down Breed under 12 months old.	299	Henry Lambert	Second	644	298	0.48	
	312	William Newton	R.	314	243	0.77	
	313	do.		314	199	0.63	
	314	William Parsons		284	199	0.70	
	315	William Parsons cup and champion.	Plate first	300	214	0.71	

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Class 59.—
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TABLE 1.—Age in days, weight, and average gain per day, &c.—Continued.

Description.		No.	Exhibitor's name.	Honors.	Age.	Weight.	Daily gain.
Class 53.—Fat wether lambs of the Hampshire or Wiltshire Down Breed under 12 months old—Cont'd.		316	Sir Edward Hulse	Third.	384	200	0.70
		317	do.	Fourth.	391	233	0.77
		318	F. R. Moore		390	233	0.77
		319	Sir G. M. Sampson		391	203	0.65
		320	do.		391	203	0.70
		321	John Barton		394	177	0.68
		323	Alfred DeMornay	Second	314	196	0.65
		324	Marquis of Bristol		291	190	0.65
		325	do.	R	374	273	0.41
		326	Edward Gittus		374	269	0.40
Class 54.—Fat wether sheep of the Suffolk (black-faced) breed above 12 and under 24 months old.		327	Alfred M. Robinson	First	360	222	0.53
		328	G. Bentinck Robins	Second	330	301	0.46
		329	do.		330	275	0.46
		330	Joseph Smith		330	246	0.44
		331	Marquis of Bristol		360	244	0.37
		332	Edward Gittus	First	314	189	0.51
		333	Edward Fyson	R	300	172	0.57
		334	G. Bentinck Robins		284	203	0.71
		335	J. Sturley Nunn		300	168	0.56
		336	Joseph Smith		300	187	0.62
Class 55.—Fat wether sheep of the Shropshire breed above 12 and under 24 months old.		337	Robert Loder, M. P.	Second	300	188	0.53
		338	Lord Chesham	R	314	236	0.42
		340	do.	Cup, first.	330	205	0.43
		341	Duke of Portland	Second	330	238	0.40
		342	Grimwood Cooke	Third	330	232	0.37
		343	Robert Loder, M. P.		330	189	0.51
		344	Robert G. Oliver	Second	254	155	0.30
		345	do.	First	300	153	0.61
		346	Charles Chappell	Second	300	150	0.50
		347	Albert Brassey	Cup, first.	307	292	0.48
Class 56.—Fat wether lambs of the Oxfordshire breed under 12 months old.		348	do.		300	302	0.46
		349	James and F. Howard	Third	300	311	0.47
		350	N. P. Stiles	R	330	282	0.45
		351	Charles Chappell		314	270	0.45
		352	Albert Brassey	R	257	193	0.75
		353	do.		284	178	0.61
		354	J. A. Miles	Third	284	170	0.60
		355	do.	First	284	177	0.62
		356	Thomas Irving	Second	284	176	0.62
		357	do.	First	300	185	0.31
Class 57.—Fat wether sheep of the Cheviot breed of any age.		358	Duke of Sutherland	R	970	217	0.22
		359	do.		1319	214	0.16
		360	Lord Poltimore	Cup, first.	1319	197	0.15
		361	do.	Second.	1335	224	0.16
		362	do.		1365	208	0.15
		363	William Gordon		1305	204	0.16
		364	Thomas Irving		940	184	0.20
		365	do.	Second	940	193	0.21
		366	Mundell and Wedder-		1335	178	0.13
		367	spoon.				
Class 58.—Fat wether lambs of the Ryeland, Dorset, or any other pure breed not specified in any of the foregoing classes above 12 and not exceeding 24 months old.		368	Herbert Farthing	Cup, first.	697	269	0.39
		369	do.	Second	697	269	0.39
		370	do.				
		371	do.				
		372	do.				
		373	do.				
		374	do.				
		375	do.				
		376	do.				
		377	do.				
Class 59.—Fat wether lambs of the Dorset breed under 12 months old.		378	William Gordon		1305	204	0.16
		379	Thomas Irving		940	184	0.20
		380	Mundell and Wedder-		1335	178	0.13
		381	spoon.				
		382	Herbert Farthing	Cup, first.	697	269	0.39
		383	do.	Second	697	269	0.39
		384	do.				
		385	do.				
		386	do.				
		387	do.				
Class 60.—Cross-bred fat wether sheep above 12 and under 24 months old.		388	Herbert Farthing	First	337	181	0.54
		389	do.				
		390	do.				
		391	do.				
		392	do.				
		393	do.				
		394	do.				
		395	do.				
		396	do.				
		397	do.				
Class 61.—Cross-bred fat wether lambs under 12 months old.		398	Duke of Manchester		633	150	0.24
		399	William Robinson	R	600	258	0.43
		400	do.	Second	600	283	0.47
		401	H. V. Sherringham	Cup, first.	660	304	0.46
		402	do.	Third	660	263	0.46
		403	H. A. Brassey, M. P.		644	243	0.38
		404	Charles W. Schroeter		270	157	0.58
		405	Edward Burbidge		281	197	0.70
		406	do.		278	194	0.70
		407	H. V. Sherringham	First	314	224	0.71
Class 62.—Cross-bred fat wether lambs under 12 months old.		408	do.	Second	314	209	0.67
		409	Thomas Rush	Fourth	300	207	0.67
		410	do.	Third	300	207	0.67
		411	William Toop	R	314	180	0.57
		412	John Clowes		261	160	0.65
		413	Francis Minett		300	201	0.69
		414	do.		300	201	0.64
		415	Algernon J. Whitcher		291	201	0.57
		416	do.		291	201	0.63
		417	do.		291	201	0.63

TABLE 2.—Comparative daily rate of increase in the classes for lambs and wethers in the Leicester, Cotswold, Lincoln, Kentish, Southdown, Hampshire Down, Suffolk, Shropshire, Oxfordshire, Dorset, and Cross-bred sheep at Islington.

Breed.	Number pens of three each.	Average daily gain.	Breed.	Number pens of three each.	Average daily gain.
LAMBS.			WETHERS.		
Kentish.....	2	.71	Oxfordshire.....	5	.46
Hampshire Down.....	11	.66	Cotswold.....	5	.45
Cotswold.....	4	.65	Hampshire Down.....	5	.45
Crosses.....	13	.64	Lincoln.....	7	.44
Oxfordshire.....	5	.64	Suffolk.....	5	.42
Lincoln.....	6	.63	Kentish.....	4	.40
Suffolk.....	6	.58	Leicester.....	6	.39
Dorset.....	1	.54	Crosses.....	2	.39
Shropshire.....	3	.54	Dorset.....	2	.39
Southdown.....	9	.53	Shropshire.....	5	.38
Leicester.....	4	.51	Southdown.....	14	.35

TABLE 3.—Relative position of the lambs and wethers given in Table 1, according to the average gain per day in pounds.

Number.	Description of animal.	Honors.	Age.	Weight.	Daily gain.
			Days.	Pounds.	Pound.
317	Sir E. Hulse's Hampshire lambs.....	Fourth.....	291	223	.77
312	W. Newton's Hampshire lambs.....	R.....	314	243	.77
260	II. Page's Kentish lambs (cup).....	First.....	240	179	.75
362	C. Chappell's Suffolk lambs.....		257	193	.75
333	E. Fyson's Suffolk lambs.....		264	224	.71
395	H. Sheringham's Cross-bred lambs.....	First.....	300	214	.71
315	W. Parsons's Hampshire Down lambs (ch. plt.).....	First.....	278	194	.70
394	E. Burridge's Cross-bred lambs.....		281	197	.70
393	do.....		284	199	.70
314	W. Parsons's Hampshire lambs.....	Third.....	284	200	.70
316	Sir E. Hulse's Hampshire lambs.....		291	203	.70
319	Sir C. M. Sampson's Hampshire lambs.....	R.....	300	207	.69
398	T. Rush's Cross-bred lambs.....	Third.....	240	160	.67
259	II. Page's Kentish lambs.....		224	189	.67
246	H. Mackinder's Lincoln lambs.....	First.....	300	201	.67
235	J. H. Elwes's Cotswold lambs (cup).....	Fourth.....	300	201	.67
397	T. Rush's Cross-bred lambs.....	Second.....	314	209	.67
396	H. Sheringham's Cross-bred lambs.....	First.....	270	179	.66
245	H. Mackinder's Lincoln lambs.....	Second.....	284	188	.66
234	T. & S. G. Gillett's Cotswold lambs.....		291	169	.65
401	J. Clowes's Cross-bred lambs.....		291	190	.65
323	A. De Mornay's Hampshire lambs.....		300	195	.65
318	F. R. Moore's Hampshire lambs.....		270	172	.64
250	A. J. Whitcher's Lincoln lambs.....		300	192	.64
248	T. Gunnell's Lincoln lambs.....		300	193	.64
403	F. Minnett's Cross-bred lambs.....		314	199	.63
313	W. Newton's Hampshire lambs.....	Second.....	314	198	.63
321	J. Barton's Hampshire lambs.....		290	149	.62
236	T. H. Hulbert's Cotswold lambs.....		240	184	.62
237	G. W. Thomas's Cotswold lambs.....	Second.....	284	176	.62
367	J. A. Miles's Oxfordshire lambs.....	First.....	284	177	.62
366	do.....		284	177	.62
320	Sir C. Sampson's Hampshire lambs.....	Third.....	291	179	.62
247	H. M. Kirkham's Lincoln lambs.....		291	179	.62
402	A. Whitcher's Cross-bred lambs.....	Second.....	254	155	.61
347	R. Loder's Shropshire lambs.....	R.....	284	173	.61
363	A. Bracey's Oxfordshire lambs.....	Third.....	284	170	.60
394	do.....		270	160	.59
266	Earl of Suffolk's Southdown lambs.....		270	157	.58
396	C. W. Schroeter's Cross-bred lambs.....		300	173	.58
390	T. Gunnell's Lincoln lambs.....		270	155	.57
362	W. Toop's Southdown lambs.....		291	167	.57
404	A. Whitcher's Cross-bred lambs.....	R.....	300	172	.57
332	E. Gittus's Suffolk lambs.....	R.....	314	180	.57
399	W. Toop's Cross-bred lambs.....				

TABLE

Number.	
334	G. B. Earl
286	Earl
289	W. T. F. M.
402	F. M.
385	H. F.
222	Mrs. A. H.
280	A. H.
336	J. S.
288	H. U.
223	Mrs. J. S.
335	J. S.
287	H. U.
224	Execu
348	R. E.
331	Marqu
349	R. E.
291	J. J. O.
228	J. H.
225	Execu
290	A. H.
350	C. Ch
226	T. & S.
388	W. R.
302	A. B.
297	A. M.
239	R. W.
327	A. M.
299	H. L.
294	Sir J.
389	H. S.
351	A. B.
326	E. G.
354	M. F.
353	J. & F.
232	H. H.
328	G. B. H.
240	J. P.
387	W. R.
229	T. R. L.
230	G. W. F.
295	Sir C. F.
254	B. W. F.
217	Execu
331	Marqu
338	Lord C.
227	T. & S.
288	T. G.
298	A. M.
253	H. P.
268	Lord W.
235	F. N.
324	Marqu
251	T. W.
216	Mrs. S.
330	Lord C.
323	Marqu
215	Mrs. S.
329	G. B. H.
380	H. F.
381	H. F.
218	Execu
391	H. A. F.
269	Lord W.
257	Execu
340	Duke o
330	J. S.
273	Sir J. K.
275	C. Chap
266	Lord A.
263	do
262	Prince
271	Earl of
263	Duke o
270	Duke o
272	Lord B.
273	G. C. C.

TABLE 3.—Relative position of the lambs and wethers given in Table 1, &c.—Continued.

Number.	Description of animal.	Honors.	Age.	Weight.	Daily gain.
			Days.	Pounds.	Pound.
334	G. B. Robins's Suffolk lambs.....		300	108	.86
296	Earl of Suffolk's Southdown lambs.....		270	147	.84
293	W. Toop's Southdown lambs.....	R.....	284	153	.84
403	F. Minott's Cross-bred lambs.....		300	163	.84
385	H. Parthing's Dorset lambs.....		337	181	.84
223	Mrs. S. Herrick's Leicester lambs.....		254	191	.83
290	A. Heasman's Southdown lambs.....	First.....	284	191	.83
336	J. Smith's Suffolk lambs.....		300	198	.83
298	H. Upton's Southdown lambs.....	Second.....	307	163	.83
223	Mrs. S. Herrick's Leicester lambs.....		294	181	.82
335	J. S. Nunn's Suffolk lambs.....		300	187	.82
402	H. Upton's Southdown lambs.....	Third.....	254	139	.82
224	Executors of B. Painter's Leicester lambs.....		300	163	.82
343	R. E. Oliver's Shropshire lambs.....		300	159	.81
331	Marquis of Bristol's Suffolk lambs.....	First.....	314	159	.81
349	R. E. Oliver's Shropshire lambs.....	First.....	300	160	.80
291	J. J. Colman's Southdown lambs.....	R.....	270	181	.49
228	J. H. Elwen's Cotswold wethers.....	First.....	630	311	.49
225	Executors late B. Painter's Leicester lambs.....	Third.....	284	133	.48
290	A. Heasman's Southdown lambs.....	Second.....	600	292	.48
350	C. Chappell's Oxfordshire wethers.....		600	283	.48
388	W. Robinson's Cross-bred wethers.....		600	290	.47
226	T. & S. G. Gillett's Cotswold wethers.....	First.....	660	311	.47
352	A. Brasse's Oxfordshire wethers.....		674	319	.47
297	A. Morrison's Hampshire wethers.....	First.....	630	292	.46
401	H. Wright's Lincoln wethers.....	First.....	630	292	.46
327	A. M. Robinson's Suffolk wethers.....	Second.....	644	298	.46
299	H. Lambert's Hampshire wethers.....		614	294	.46
294	Sir J. Kelke's Hampshire wethers.....	Second.....	600	304	.46
389	H. Sheringham's Cross-bred wethers (cup).....	First.....	600	302	.46
351	A. Brasse's Oxfordshire wethers (cup).....	First.....	600	301	.46
336	E. Gittus's Suffolk wethers.....	First.....	614	276	.45
354	M. P. Sillidge's Oxfordshire wethers.....	R.....	630	282	.45
333	J. & F. Howard's Oxfordshire wethers.....		600	284	.45
232	H. Inge's Kentish wethers.....	First.....	630	275	.44
328	G. B. Robins's Suffolk wethers.....	Second.....	600	280	.44
240	J. Pears's Lincoln wethers.....	R.....	600	258	.43
387	W. Robinson's Cross-bred wethers.....		600	260	.43
229	T. R. Halbert's Cotswold wethers.....		630	274	.43
295	G. W. G. Thomas's Cotswold wethers.....	R.....	644	279	.43
230	Sir C. Daupson's Hampshire wethers.....		614	254	.42
354	R. W. Tossell's Kentish wethers.....		600	252	.42
217	Executors B. Painter's Leicestershire wethers (cup).....	First.....	614	256	.42
331	Marquis of Bristol's Suffolk wethers.....	First.....	630	265	.42
838	Lord Chesham's Shropshire wethers (cup).....		644	271	.42
227	T. & S. Gillett's Cotswold wethers.....	Second.....	660	277	.42
298	T. Gunnell's Lincoln wethers.....		660	277	.42
288	A. Morrison's Hampshire wethers.....	Third.....	600	246	.41
253	H. Page's Kentish wethers.....	Second.....	614	251	.41
208	Lord Walsingham's Southdown wethers (cup).....	First.....	630	259	.41
235	F. Nanne's Kentish wethers.....		674	273	.41
324	Marquis of Bristol's Suffolk wethers.....	R.....	607	243	.40
251	T. Wootton's Kentish wethers.....	Second.....	614	248	.40
216	Mrs. S. P. Herrick's Leicester wethers.....	Third.....	630	253	.40
830	Lord Chesham's Shropshire wethers.....		660	263	.40
400	H. Sheringham's Cross-bred wethers.....		674	269	.40
325	Marquis of Bristol's Suffolk wethers.....		614	249	.40
215	Mrs. S. P. Herrick's Leicester wethers.....		630	246	.39
329	G. H. Robins's Suffolk wethers.....	First.....	607	269	.39
330	H. Parthing's Dorset wethers (cup).....	Second.....	614	232	.38
381	H. Parthing's Dorset wethers.....		644	243	.38
218	Executors late B. Painter's Leicester wethers.....		614	230	.37
391	H. A. Brasse's Cross-bred wethers.....	R.....	630	243	.37
269	Lord Walsingham's Southdown wethers.....	Third.....	600	244	.37
207	Executors of H. Penfold's Southdown wethers.....		630	221	.35
340	J. Smith's Suffolk wethers.....		600	204	.34
330	Sir J. Kelke's Southdown wethers.....	Second.....	630	215	.34
254	C. Chapman's Southdown wethers.....		630	214	.34
266	Lord Alington's Southdown wethers.....		630	213	.34
265	do.....		630	217	.34
292	Prince of Wales's Southdown wethers.....		630	208	.33
271	Earl of Onslow's Southdown wethers.....		630	210	.33
273	Duke of Richmond's Southdown wethers.....		630	209	.33
279	Duke of Hamilton's Southdown wethers.....				
272	Lord Braybrooke's Southdown wethers.....				
273	G. C. Carew-Gibson's Southdown wethers.....				

TABLE 3.—Relative position of the lambs and wethers given in Table 1, &c.—Continued.

Number.	Description of animal.	Honors.	Age.	Weight.	Daily gain.
			Days.	Pounds.	Pound.
261	Prince of Wales's Southdown wethers.....		630	203	.82
368	T. Irving's Cheviot wethers.....	Second..	600	185	.81
341	G. Cooke's Shropshire wethers.....		630	190	.80
384	Duke of Manchester's Cross-bred wethers.....		638	150	.24
369	T. Irving's Cheviot wethers.....	First.....	970	217	.22
377	T. Irving's Mountain wethers.....	Second.....	940	193	.21
376	J. Irving's Mountain wethers.....		1305	204	.16
374	W. Gordon's Mountain wethers (cup).....		1365	224	.16
372	Lord Poltimore's Mountain wethers.....	First.....	1365	224	.16
370	Duke of Sutherland's Cheviot wethers.....	R.....	1319	214	.16
371	do.....		1319	187	.15
373	Lord Poltimore's Mountain wethers.....	Second.....	1365	208	.15
378	Mundell & Wedderspoon's Mountain wethers.....		1335	178	.13

The above tables have been constructed on the same plan which has been observed in those for cattle. The average gain per day in pounds is calculated to the nearest decimal; that is to say, when the remainder represents a fraction of greater value than one-half it is reckoned as one, and where more than one animal is represented by the same average rate of daily gain relative positions are determined by the numerical value of the remainder. With regard to the tables of averages, it will be seen that the numbers exhibited refer to pens of three, the weights and daily rate increase referring, of course, to an average of the three animals in each pen. The weight of each pen has been divided by three; a remainder of two has been reckoned as one, and a remainder of one has been dropped.

SHEEP AND MUTTON IN 1883.

[From the Live Stock Journal. Inclosure No. 7—Consul-General Merritt's report.]

The past season has been on the whole an average one to the flockmaster. Neither liver rot nor fluke have disturbed the flock, although foot-and-mouth disease and scab have caused some anxiety. The losses in Lincolnshire and Norfolk were most severe, and caused a drop at some of the sales. The regulations in force to prevent the spread of the disease were ineffective, as the local authorities in some areas granted licenses which were refused in other places; hence discontent and dissatisfaction, encouraged by bad seasons, has produced a wonderful progeny of evils.

In the spring there was quite a stampede. Farmers usually endeavor to have a good crop of early lamb for market, which helps to pay the way at Easter. An embargo, however, was placed on the sale. Her Majesty the Queen issued an order that no lamb would be required for the royal household. This immediately lowered the price of this favorite dainty, and occasioned a serious loss to flockmasters ready to sell. The outcry against the order was so great that another was issued explaining Her Majesty's commands only affected the royal household, and was in no way intended to interfere with the sheep markets.

Doubtless Her Majesty's advisers, looking to the fearful decrease in our flocks of late years, were anxious to retain all the ewe lambs possible for future use. But flockmasters know their business, and can attend to it. They can spot the lambs which ought to be fed for lamb and those which should make mutton. Sheep-breeders have found out that mutton pays better than wool, and that fat lamb brings a better return than mutton. The produce of black-faced short-wooled rams and white-faced long-wooled ewes is found to be a profitable early lamb for the market; and the lamb dropped by Dorset horns is *par excellence* the dainty of early spring. In Scotland early lambs are purposely bred from old ewes, being their last crop of lambs; consequently it pays to feed both with as much artificial food as possible. These old ewes begin to lamb in February, and drop more lambs than ordinary stock ewes, because they are put in good condition when the rams are with them. It would not pay to keep the lambs till they got bigger, as it would increase the bill, and as mutton fetch less. Therefore flock-

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masters in both countries try to make as much as possible out of the popular taste for early lamb and green peas.

The prevalence of foot-and-mouth disease and the restrictions in force respecting the movement of cattle contributed to make mutton dear. The trade in store-stock was almost entirely stopped, as the movement orders in some districts were very stringent, and in others quite the reverse. Various representations were made to the Government, without any appreciable effect.

At the wool sales in the west of England there was great competition, especially in the month of July. During that month nearly half a million fleeces of Southdown and Dorset-horn wool were sold at the pub- sales in Wilts, Hants, and Dorset.

One Irish firm spent over £2,000 at one of the Wiltshire sales, and within a fortnight it was estimated that over £30,000 had been spent on Wiltshire wool alone. The general average was a little less than last year, and the competition keen. At Devizes the 10d.—the highest price fetched there this year—to 36s. 2d., and ten years ago 42s. 6d. to 47s. 6d. were the prices realized. The September sales were rather quiet, the best of these sales, however, was to favor buyers.

The sales were very successful, if we take them all round. Several of the Down breeds were fancied by German and French connoisseurs, and numerous purchases were made of Oxfordshire, Hampshire, and Shropshire Downs. Time was when there was a great demand from Australia for English sheep and cattle. The policy of closing the ports against all importations, however, prevents Australian breeders visiting or buying in our markets. Our Australian cousins were never afraid of a price, and time was when Messrs. Duddington, of Pantong, got a check for 200 guineas for one of the rams of that famous flock. Nowadays the Australians do not come to Old England for their stock, but according to the report of recent sales 3,150 guineas were paid for an improved Lincolnshire ram. These prices have not been reached in England, although it is highly probable that the famous Robert Bakewell, of Dishley, fingered a few guineas, both for his rams and ewes, and also for service. We must, however, take the market as we find it, and therefore direct attention to the fortunes of the various breeds in the sale ring during the season of 1883. Naturally Bakewell's Dishley breed takes the pride of place.

LEICESTERS.

This famous breed owe a great deal of their excellence and popularity to the efforts of Robert Bakewell, of Dishley. It also obtains the foremost place in the royal catalogue, and its popularity is still maintained by breeders, such as Messrs. T. H. Hutchinson, Geo. Turner, Brown, Linton, Jordan, &c. The value of the breed, however, is generally indicated at the autumn sales, which are confined to a few English counties and to Scotland.

At Forres, over 70 rams were offered. Mr. Mackessack, of Cloves, gave the highest price of £20 for a strong well-brought sheep, belonging to Mr. Hunter, of Depple, whose average was £7 higher than last year. At the Muir of Ord fair, Mr. Gorran, of Arabella, sold 40 at an average of £6.

BORDER LEICESTER.

This breed is a great favorite in the north of England, and also in Scotland. At the Edinburgh sales the prices, owing to foot-and-mouth disease, were 25 per cent. below those current at the Lothian sales in 1882. At Kelso, the rams, which were forward in fine condition, numbered 1,867, being an increase of 365 over last year's total. Lord Polwarth's famous Mertoun rams secured the highest price—£125—for a grand ram. From the same flock Lord Arthur Cecil purchased one at £61; the Hon. R. Baillie Hamilton, one at £51; and Mr. Dodds, Cothill, one at £50. The Mertoun average was £26 14s. 8d. Lord Polwarth also headed the sales last year, when the highest-priced ram made £78. Mr. Thompson, Baillieknowe, got £66 for a ram; the average price being £20 3s. Miss Stark, Mellendean, secured £61 for the best lot in her pen, the lot making an average of £18 3s. 3d.

At Edinburgh, the Craigend rams met with the best demand, and made the highest average, £13 13s., although this was £3 12s. 3d. less than last year. The highest-priced ram was bought by Mr. Milroy, Torrance, for £30; and Mr. Alexander, Easter Dean, secured the second-price Lauder ram at £29; Mr. Balfour, of Whittinghame, M. P., obtained the good average of £11 5s. 4d., his first-price Inverness ram being purchased by Mr. Ainslie, Hillend, for £31. The highest price last year was £94 10s., given for a fine ram from the celebrated Oldhamstocks flock. Messrs. Clark, Oldhamstocks, have for fifteen years had the highest average for Border Leicesters, but they had only the third place on this occasion. Their average was £12 5s. 1d., as compared with £20 11s. 3d.

last year; and £30 was the highest figure going, which was paid by the Marquis of Tweeddale. The Duke of Buccleuch had an average of £6 2s. 6d., being £5 15s. under last year, and his highest price was £28.

At the Irish ram-breeders' sale, Viscount de Vesci offered twelve rams, which obtained the best average, and the highest price for an individual ram was £31 10s. The Border Leicester is a favorite sheep, and makes capital mutton.

COTSWOLDS.

Cotswolds are greatly favored on the Gloucestershire hills, whence they derive their name, and many breeders in other counties are exceedingly fond of the breed. Mr. Robert Garne, of Oldsworth, obtained the good average of £20 1s. 10d. for an exceedingly even lot; and Mr. C. Mace and Mr. J. Garne had £9 5s. and £9 respectively. But at Hempton Green Mr. T. Brown's celebrated Marham Hall flock met a ready sale at from 8 to 18½ guineas, the sixty averaging £12 16s. Last year Mr. Brown's highest price was 17½ guineas and his average £11 3s. Mr. J. B. Aylmer, of Fincham Hall, made the high average of £12 18s.; the top price last year was 15 guineas. Mr. T. Thornton's year the prices ran from 9 to 19 guineas, and the average £12 6s., as compared with £8 8s. in 1881. Mr. Thomas Allen, of Markshall, offered a number of rams at Horringer fair, which made prices ranging from £9 downwards. At the letting of the West Dereham Long-wools, Hugh Aylmer had a most satisfactory sale. The rams offered were of a fine uniform character, presenting in a high degree that combination of good qualities for which the West Dereham flock is famous. The average for the lambs was £7 10s. 9d., against £5 19s. 6d. last year. The highest price was £15 15s.

LINCOLNS.

This long-wool breed seem to decline in value. Possibly this was due this year to the prevalence of disease and the restrictions in force respecting movement. Time was when a colonial breeder would have given 150 guineas for a ram which last season only fetched about 40 or 50 guineas. The averages made were much lower than those of last year—a fact which the figures we give indicate.

At Biscathorpe, Louth, the late Mr. Thomas Kirkham's flock was disposed of. Sixty-eight rams averaged a trifle over 14 guineas per head. The highest price was 62 guineas. Mr. Edward James Davy (Owersby, near Market Rasen) sold 20 rams. The highest price was given by Mr. J. H. Vessey, 58 guineas. The average was 17 guineas. Mr. Charles Clarke attracted a large company to Ashby-de-la-Launde. A symmetrical shearling was secured by Mr. J. W. Davy, of Owersby, for 37 guineas; a magnificent sheepfell to the bid of Mr. Taylor Sharpe, of Baumber, for 36 guineas. Mr. J. H. Caswell, of Laugh-ton, hired a fine animal for 50 guineas. A remarkable fine three-shear fell to the bid of Mr. J. R. Kirkham, of Cadeby, at 27 guineas. Shearlings averaged £14 15s. 10d. The hundred sheep realized a total of £1,478 18s. 6d., an average of £14 15s. 9d. Last year the average of 100 sheep was £13 5s. 8d. For the rams of the Hultott flock, the property of Messrs. W. F. and C. Robinson, Mr. J. Robinson, of Anderby, gave 40 guineas. The Ulceby Grange flock, the property of Mr. John Turner, averaged 11 guineas. The higher prices were £25 10s., £24, and £21. Mr. Henry Dudding, of Riby Grange, near Grimsby (late of Pantou), sold 30, making an average of nearly £12; Mr. Samuel Grant, Brigg, got one for 21 guineas, and another at £15 (for exportation to New Zealand). The Wootton Dale rams, the property of Mr. Thomas Taylor, Havercroft, averaged nearly £9. Forty rams of the famous Cadeby flock, bred by Mr. John Walesby, Kirkham, averaged £15 10s. per head, one of the best averages obtained in Lincolnshire last season. The highest prices were 54 and 56 guineas. The highest-priced ram belonging to Mr. J. Pears, of Mere, was bought by Mr. H. Smith, of Cropwell Grove, for 50 guineas. Mr. E. Paddison, of Langley, obtained an average of £8 10s. 1d. Mr. W. Grimes, of Harmston, made an average of £10 18s. 4d. Thirty shearlings, bred by Mr. C. S. Dickenson, of Ashfield House, Branston, averaged £10 7s. 6d. In Ireland the highest price was 24 guineas, obtained by Mr. R. E. Going, of Nenagh, and his average was £2 over that of last year.

YORKSHIRE OR WENSLEYDALE.

The origin of this breed is somewhat obscure. It is locally termed Wensleydale, although known in the south of Scotland as the Yorkshire. It has a dash of Leicester blood, and it is through this cross that the blue faces were first introduced. The Wensleydales furnish rams for crossing with black-faced ewes and Cheviots, the produce being styled "half-breeds" or "Mashams." The rams follow the ewes over the hills,

and the breed is highly valued for its

At the present time, the best bred rams are £16; good

These are the best that I have seen for some time. The success of the breed was placed in the hands of the prize with the clyst, sold shows, and guineas and lot 10, and rams for £100 year-old ram reading, and Mr. Fr

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and the ewes are very prolific, and excellent milkers. The general character of this breed is hardy, with a tendency to accumulate flesh rapidly. The word "Masham" is given to these sheep because a large fair is held

At the annual lamb fair more than 60,000 sheep and lambs were penned; buyers were present in large numbers. Trade was rather slow, but a good business was done. Good-bred rams were in great demand, and found a ready sale at prices varying from £9 to £16; good-bred ram lambs, £3 10s. to £4.

DEVON LONGWOOLS.

These are chiefly confined to Devon, and few sales were recorded. One thing is certain that Sir J. H. Heathcote-Amory still continues to exhibit at the Royal, and that was placed second with an uncommonly neat and good Devon Longwool; he had also the *he* and *r* for another excellent sheep of the same breed; and he carried off the first prize with the only entry in the Shearling Ewe class. Mr. C. Norris, of Motion, Broad-clyst, sold 20 rams for £217 7s. Many of the sheep had taken prizes at the agricultural shows, and were sold in fine condition with heavy fleeces. One ram was let at 18 lot 10, and for it he paid 21 guineas. The highest price was given by Mr. Bowden for rams for £103 9s. The highest figure offered was 15½ guineas by Mr. Gould for the 2-year-old ram which won third at Launceston, and had been *he* at Cardiff, Torquay, and Mr. Franklin's 9 guineas.

DORSET HORNS.

The Dorset Horn is pre-eminently the sheep which produces the early lamb in spring. This breed had wonderful luck during the past season, no doubt owing to the outcry about early lamb. But the breed is evidently adapted for early maturity, and at the spring market at Croxton Farm, near Dorchester, unprecedentedly high prices were realized for Dorset Horns. Two-tooth ewes ranged from 75s. to 95s. apiece, whilst the four-tooths made from 69s. to 88s.; six-tooths brought from 70s. to 83s., and the off-going ewes 66s. to 69s.; couples, 98s.; rams, 4 to 5 guineas; and ram lambs, 5½ to 10 guineas per pair. This lot was brought to a high state of perfection by Mr. Cox, this being amply proved by the extraordinary prices obtained, which are still more so, considering the sheep had been previously shorn. That this variety is becoming popular there is no denying, and at the annual sale Mr. T. Ensor, of Dorchester, disposed of 20,000 in one day. This was considerably in excess of last year by several thousands. The result was due mainly to the efforts put forth by Mr. Ensor, who offered prizes of the value of 30 guineas for the best drafts of horn ewes entered for sale at the fair; and this evoked a spirited competition. The prize ewes of Mr. Mayo's fetched the top price—80s.; other good lots made 68s. to 74s.

SOUTHDOWNS.

This is the principal breed of the Downs variety, and is favored by the Prince of Wales and Lord Walsingham, who have flocks of unrivalled excellence. The Southdowns are beautiful sheep, and, though short in wool, make capital mutton. Very few sales took place last season. The rams belonging to the executors of the late Mr. Thomas Jackson, Deepdale, near Scarborough, were sold. The 36 rams offered were in high condition, and realized £6 10s. average. Two grand sheep were purchased by Lord Londesborough for £9 and £7 each; four others sold for over £9 per head, and another for £8 5s. Mr. W. Rigden, of Hove, sold 26 shearling rams at an average of £21 16s. 6d. each. This was a capital price for sheep, and Mr. Rigden was well rewarded for his labor in breeding such an excellent flock. In addition to the numerous honors Mr. Rigden's flock has gained at the Royal Show since 1850, it has also taken 24 prizes at the Bath and West of England, 4 prizes at the Southern counties, and various prizes at other shows. The secret of the success of the Hove flock doubtless lies in the fact that the present shepherd has been with Mr. Rigden for twenty-one years, and during that time 28 first, 26 second, and 6 third prizes have been won.

ROMNEY MARSH.

This breed, which is confined chiefly to this district, has been wonderfully fortunate of late years, and Mr. George Slater, of Canterbury, does all he can to keep it in front. In the south Kentish sheep are extremely popular. At a sale of 57 rams belonging to Mr. Powell prices ranged from £7 7s. to £13, and 4 fetched between £29 and £35. These are good figures to pay for the much-despised Kentish breed.

OXFORDSHIRE DOWNS.

These have taken quite a firm hold of the affections of many breeders in Bedfordshire, Bucks, Hants, &c. The Oxford Down is an attractive sheep, and the specimens exhibited at the Royal York Show were worthy of the national gathering. Quality was observable all along the line, and where so much excellence was discernible they were most difficult classes to judge. The ram sales were fully successful, and attracted numerous buyers from the continent. At Mr. John Treadwell's sale at Upper Winchendon, a number of shearling and ram lambs were disposed of at an average of a trifle over £23 12s. A number of the rams were bought for Germany, although a few were picked up by our Gallic neighbors. The Fyfield flock of Mr. A. F. Nulton-Druce averaged £17 10s., and the Biddenham lot realized the handsome average of £15 11s. Mr. Albert Brassey, who was so successful at the Royal Show at York, was equally fortunate in the sale ring. The Heythorp flock averaged £14, being an increase of nearly £1 compared with last year's average. Mr. George Street, of Maulden, obtained an average of £10 1s. 3d. Mr. Fred. Street, of Somersham Park, also disposed of 40 fine sheep at an average of £14 9s. 8d. Mr. John Worley's flock averaged £14 3s. 2d., and Mr. Ed. Gillett's Bampton flock obtained an average of £15 3s. Drafts were sold from various flocks, the averages ranging from 4 to 10 guineas. Equally favorable prices were obtained for ewes and ewe lambs; and on the whole the Oxford Downs went off very well. They are great favorites on the continent, and before long will be found in the United States.

HAMPSHIRE DOWNS.

These are a comparatively new variety,* and are said to have been produced by South-down crosses on the old Wiltshire sheep. The breed possesses in a high degree the qualities of fecundity and early maturity. Indeed, we have known 100 wether lambs, just a little over six months old, fetch 72s. per head; and as for weight, three lambs under ten months weighed at the last Smithfield Club Show (1882) 224 pounds each (live weight, or upwards of 35 pounds per quarter butchers' meat. These sheep are massive, broad, even, deep, and close-wooled, and do well on dry chalk soils. The Hampshires fared particularly well both in the show-yard and in the sale ring. Mr. Alfred Morrison, after his Hamburg success, won well at York with large, long, and lusty animals. Mr. William Parsons (Micheldever) also had a fair time of it, and secured first and second in the shearling ewe class with well-rounded, neat sheep. In the sale ring his flock averaged £15 13s. for rams, and 97s. 3d. for ewes. The Hackwood flock of Mr. John Barto averaged £12 10s. The Wrotham Hill Park lot were quickly disposed of at an average of £6; two of the rams being bought for exportation to Jamaica. The supply at Welton fair exceeded 100,000, and were chiefly bought by flockmasters in the western counties. Mr. Twiddell's flock fetched from £4 14s. 6d. to £12 12s.; and Mr. John Parris's averaged about 7½ guineas, and Mr. H. Dudding sold 16 rams at an average of £12; and Professor Wrightson disposed of 40 at from £6 to £7 10s. each. Mr. Oakley had 150 from his Underwood Hall flock, which fetched from £7 to £10 each. Six rams were bought at Peterborough at £5 10s. each for shipment for Buenos Ayres. Mr. F. Boyce (Manor Farm) disposed of 1,400 ewes and lambs at high prices, the total sum realized being £4,484 17s. The Broadfield lot, belonging to Mr. William Lane, averaged £17 7s. 8d., the average last year being £17 15s., and in 1881 £12 8s. 9d. The Homington flock was weeded to the extent of 131 lots. The rams were let as high as 67 guineas. Mr. Dibben hired at 42 guineas; Mr. Parsons, of Micheldever, at 61 guineas. Ram lambs were sold at 41 guineas, which was given by Professor Wrightson. At the sale of Mr. Palmer (Berry Court, Wallop, Hampshire) ram lambs were let at from 7½ to 22 guineas each, the average of 70 being £11 19s. 6d. A number of rams of the well-known Font-hill flock, which took the champion prize at the Hamburg Show, were let and sold at high prices. The ram lambs were let for the season at 64 guineas. The average at which 13 lots were hired was £34 6s. 6d. The selections from the flock of Mr. W. Cheyney Street made satisfactory prices, and the draft ewes, which were remarkably well matched, sold for upwards of 5 guineas each.

SHROPSHIRES.

This breed is making great headway, and seems to be a great favorite everywhere. They are fancied not only in Shropshire, but are found in Scotland, Wales, Ireland, and in several continental countries, while numbers have been exported to Canada. That the breed is decidedly popular cannot be denied.

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n Bedfordshire, specimens exhibiting quality was obtained they were most selected numerous Winchendon, a trade over £23 were picked up and averaged £17. Mr. Albert, a fortunate in nearly £1 commanded an average of 40 fine sheep at £2d., and Mr. sold from valuable prices were sent off very found in the

uced by South-degree the quality of lambs, just a few lambs under each live weight, massive, broad, Hampshire fared Morrison, after animals. Mr. first and second the ring his flock of Mr. John disposed of at an a. The supply of ewes in the west; and Mr. John average of £12; Mr. Oakley had six rams were Mr. F. Boyce all sum realized averaged £17 7s. Homington flock of 7 guineas. Mr. Ram lambs were sale of Mr. Pal- to 22 guineas all-known Font-let and sold at The average at Mr. W. Cheyney well matched,

The top figures in the sale ring are paid for Shropshires, and they still maintain their high character for good mutton. High prices were paid for good rams. Lord Chesham obtained £178 for one; Mr. R. Thomas sold two at £110 and £126; Mr. J. Evans got 115 guineas for one; Mr. J. Beach 110 guineas; and Mr. T. J. Mansell 105 guineas. The Birmingham sales were most successful. Mr. C. Randell gave 100 guineas for one of his lordship's shearlings. The ewes at Birmingham also made high figures. The lot sent by Mr. Henry Lovatt, of Bushbury, Wolverhampton, were run up to 200s. each; and some of Mr. A. S. Berry's flock sold for 210s. each. The lot sent by Mr. J. Pulley, M. P., were sold at high prices for Canada. The highest average for 60 ewes was obtained by Lord Chesham at 150s., an average which has never been exceeded at Birmingham. The Hattons flock, belonging to Mr. J. Beach, sold and let well, and the average for rams was £27 12s., and for ewes £7 14s. 10d. Mr. T. J. Mansell, of Dudmaston, secured 105 guineas for his first-prize shearling at York, and the average was £24 12s. 4d. The famed Uffington flock of Mr. John Evans averaged £30 6s. 2d. for 37 shearing rams, and a little over £10 for ewes. At the annual sale of Messrs. Crane and Tanner, of Shrewsbury, Lord Chancellor was sold at 85 guineas, and Royal Consort let at 75 guineas. The average was £19 14s. 10d. One lot of five shearing ewes was bought by Mr. Darling at 16 guineas per head. Mr. Charles Byrd never penned a better lot than those he offered at Littywood. The 34 averaged a little under 8½ guineas a head. The selection of rams and ewes from the Montford flock, the property of Mr. T. S. Minton, averaged for the rams let and sold £22 3s. 6d. The ewes, for which this flock is so famous, averaged £9 14s. each. Mr. Thomas Mansell's Harrington rams sold well. One was let to Mr. Farmer at 85 guineas. A two-shear ram, Baron Plassy, was sold to Mr. J. L. Naper at 86 guineas. The average of the rams was £24 18s. 9d., and the ewes averaged £6 11s. 9d. Mr. Robert Fisher's rams (Leconfield, Beverley) averaged a little over £6 11s. average obtained for the Onibury flock of Mr. F. Bach was £10 12s. 10d. The flock belonging to the late Mr. George W. Langdale, of Leconfield Park House, near Beverley, was disposed of, the rams making an average of £7 5s., the ewes fetching prices up to 87s. each. The Beaumontcote rams, the property of Mr. William Hesselting, made an average of nearly 12 guineas. The highest price was 31 guineas. At Beaudesert 35 rams, the property of Mr. John Darling, realized an average of £9 14s. 6d.; the ewes (a splendid show) £5 15s. For the ewes the highest prices realized were 155s. and 160s. each. Mrs. Barr's rams at Odstone Hall made fair prices, and the ewes sold at 160s. each. Mr. Richard Thomas, of Baschurch, got an average for rams sold and let of £28 7s. each, and ewes gave £126, and a Canadian gentleman paid £110 5s. for another lot. Mr. J. L. Naper, of Lougherow, had a good sale. Mrs. Barrs, Odstone Hall, Atherstone, got the gem of the shearlings at 120 guineas, the highest price ever paid for a ram in Ireland. The 36 rams averaged £18 6s. At Mr. Thomas Penn's Home Farm, Downton Castle, the highest priced shearling ram was bought by Mr. J. C. Phillips at 35 guineas. The old-established Haughton flock was dispersed on account of the decease of the proprietor, Mr. Charles Wadlow. The ram Bridgnorth was knocked down at 30 guineas. The 23 rams sold averaged £11 9s. 7d. each. Mr. J. E. Farmer sold a lot of rams and ewes. The shearling rams ranged from 7 to 23 guineas, the latter being the highest price, and paid by Earl Powis. The ewes fetched fair prices. During the season Colonel Ridgway was a good buyer, and turned up at several sales, and what is more, selected good stuff and gave stiff prices. Good stock were sold, and their value was realized. Indeed, all round the Shropshire sales of 1883 will compare favorably with those of previous seasons.

CHEVIOTS.

The lithe and handsome Cheviots were in great force at the Lothian and Border sales. The Cheviots showed a great increase in number on last year. At the autumn sale at Hawick upwards of 1,300 rams were catalogued, being nearly 500 more than last year. The bulk were Cheviots. Mr. Robson, Bellingham, sold a Cheviot ram for £55, and another was sold for £45. The average was £13 19s. In a few instances the average prices of last year were overtopped. The highest price obtained for the Hindhope rams was £51; at Edinburgh there was some crack lots, and the animals were shown to the best advantage. In several cases they realized the highest average, £9 6s. 4d., and they likewise topped their class, Mr. Paterson, Crookedston, giving £25 for a handsome shearling.

THE BLACK-FACED SUFFOLK.*

These are rapidly coming into favor in East Anglia. This breed differs to some extent from the Scotch Blackfaces. The Suffolks are proper niggers, so far as face and legs

* First described in August, 1883, by H. Kains Jackson, in "The Field," but here unacknowledged.

go, and the more sable they are the better. This breed is a cross between the South-downs and Norfolk Blacks of half a century ago, probably improved with Hampshire Down crosses. The meat of the Suffolk is juicy and lean, and the mutton is much in request in various centers. The breed is active and hardy, and can live where other varieties would be famished. Mr. E. Gittus made the top figure of the season, namely, £20, and the average being £14 2s. Mr. Gittus's shearling ewes fetched 126s. for the best pen at Newmarket, where Messrs. Slater and Northend both sold rams at 26 guineas each, and the Marquis of Bristol got 25 guineas for another. At Ipswich fair Mr. J. A. Smith's consignment was one of great promise, having been selected from the best ewes of his flock. He sold 10 ram lambs at an average of 13 guineas, and 40 lambs at an average of £9 3s. Messrs. Sexton and Grimwade, who were the first to inaugurate the auction competitions, sold 70 ram lambs and a fine lot of ewe and wether lambs. A fine ram was purchased by Mr. Robert Cross for £5 5s. Mr. W. Gurdon, of Brantham Court, sold his best specimen for £13 10s. Mr. E. Fyson sold 12 ram lambs at 12½ guineas, &c. Mr. Jacob Walker sold his flock, as he was about to take a smaller farm. The Suffolk ewes made high prices. The 210 shearlings realized a total of £911. The highest figure realized, 95s. per head. Shearling rams realized from £8 to £3.

SCOTCH BLACKFACES.

In Scotland Black-faced sheep are supplanting the Cheviots, as it is a more hardy breed, which has weathered the storms of severe winters more successfully, and on this account larger numbers have been offered for sale all over the country. They met an exceedingly good market, and averaged within a shade of £16 each. Mr. Brydon, of Burncastle, had the next average of £10 13s. The highest price paid of £45 was by Mr. Thorburn, Stonehill. Mr. Dodd, Northumberland, also bought one at £44. The Duke of Argyll bought one at £37, and another at £24.

Mr. Charles Howatson, of Glenbuck, Ayrshire, offered a wonderful lot at his twelfth annual sale, and made capital prices. A three-shear ram made £20. The highest prices were given for three shearling rams, sired by Glenbuck Yet. Mr. Fleming, Lesmahagow, paid the top figure of £43 for Glenbuck Again. Mr. M'Naughton, Aberfeldy, bought Arabi at £30; and Mr. Hamilton, Tyndrum, gave £29 for Duncan Gray. The top lambs got by Glenbuck Yet made the remarkable average of £13 14s. 6d. each, Mr. Brydon, Burncastle, paying the extraordinary sum of £28 10s. for a handsome ram, combining symmetry, size, and substance. This price has never been equaled for a Black-faced lamb, the highest last year being £13.

Mr. Malcolm, of Pottaloch, Argyllshire, sold some Black-faced sheep. The shearing tups averaged £7 a head. Mr. Campbell, Ormaig, bought the highest priced one at £36. The total increase on the stock proceeds of last year's sale for a similar number of sheep was £600. This shows that the Blackfaces are gradually rising in value in Scotland.

There were doubtless many other sales and incidents worthy of remark which transpired during 1883; but we have simply dealt with the facts as presented to us in the markets. Under the circumstances, flockmasters are to be congratulated on the results of the past season's sales, and to hope for a continuance of the same friendly competition in the year 1884.

SHEEP PORTRAITS.

[Inclosure No. 8 in Consul-General Merritt's report.]

The portrait (Plate 367) is reproduced from the Agricultural Gazette for 1874, as a fitting illustration of the Oxford Down breed. This ram was shown by Mr. C. Howard at the Hull and Cardiff meetings of the Royal Agricultural Society, and he was commended at both places. Everyone knows that the history of the breed includes many names, such as Treadwell, Gillett, Druce, Howard, Street, and others; and illustrations might have been selected—reproduced from former years—of sheep from any of their celebrated flocks. We have selected the illustration here given, however, as being on rather a larger scale than the others; and, notwithstanding a certain distortion due to the lens, including much exaggeration of the head and muzzle of the sheep, as being a fair representation of the excellent and massive form, fine character of wool, &c., indicative of the breed.

This breed originated in a cross between the Cotswold ram and the Hampshire Down ewe; and Mr. Twynam, now of Winchester, was one of the leaders, forty years ago, in maintaining that the breed should be made permanent by continuing to breed from these cross-bred sheep, until at length a permanent type was established. This has now been

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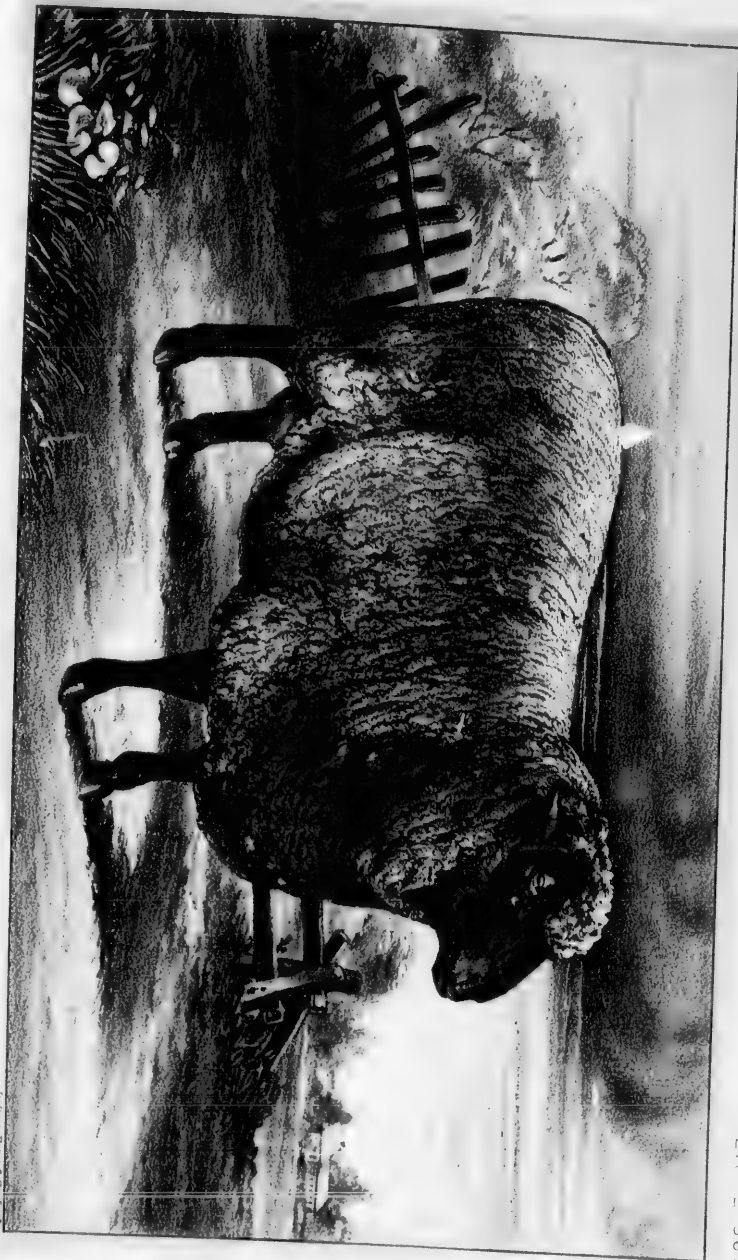
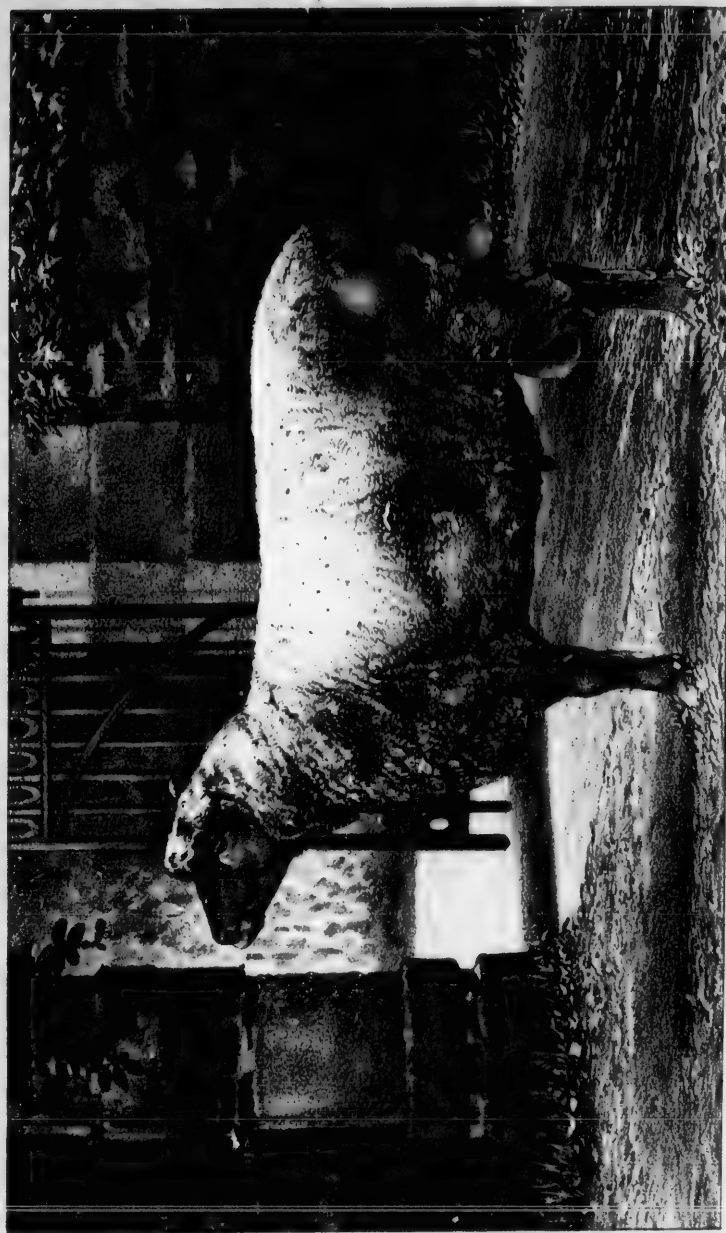


PLATE 367





MR. A. F. MILTON BRUCE'S OXFORD DOWN RAM "CAMPSFIELD"

Julius Han & Co. Lith.



Julius Ryan & Co. Lith.

MR. A. F. MILTON BRUCE'S OXFORD DOWN RAM "CAMPSFIELD"



Arthur Reed & Co. Lith.

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well-bred Oxford

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accomplished. The breed is remarkable for mass and quality of mutton, combined with a heavy fleece. Prices are large, and those for ewes in any other breed are now given for well-bred Oxfordshire Down rams.

MUTTON AND WOOL.

The portraits will, we believe, be admitted to be successful representations of two capital breeds of sheep. The form, thanks to the photographer, and even the character of the wool, thanks to the artist, are very successfully depicted. There is a certain amount of distortion seen in the exaggerated length of the hind leg, as compared with fore leg in the Oxford Down; and that the two pictures are not drawn to a common scale may be gathered from a comparison of the shepherds, as well as of the sheep; but we claim to have succeeded, nevertheless, in representing to our readers good and characteristic portraits of two very important breeds.

Plate 368 represents "Hermit," a Lincoln ram, 3 years and 4 months old, shown at Liverpool by Mr. Henry Smith, of the Grove, Cropwell Butler, Bingham, Nottinghamshire. He took the first prize for Lincoln rams, other than shearlings. He was bred by Mr. T. Casswell, Pointon, Falkingham.

Plate 369 is a portrait of an Oxfordshire Down ram, "Campfield," belonging to Mr. A. F. Milton Druce, and shown at Liverpool in the class of older rams, where it took the first prize. It is 3 years and 5 months old, and was bred by the exhibitor.

BERKSHIRE PIGS.

[Inclosure No. 9 in Consul-General Merritt's report.]

SUTTON, WIMBORNE, Dorset,
January 8, 1884.

Sir: My specialty is pigs; therefore I imagine any remarks on such would hardly come under the above-printed queries. I have for years been very successful as a breeder of large white pigs, and more recently of Berkshires, having secured at the Smithfield Club show, in December, 1883, the champion award for the best pen of pigs in the show. These Berkshires at eight months one week and three days old weighed each 16 score pounds. My white pigs are hardy, and famed for size and early maturity; *e. g.*, the pen exhibited at the same time as the Berkshires, also taking first prize, attained the average weight each of 32 score pounds at sixteen months. My opinion is that the Berkshire breed is the most hardy, and could be bred and reared in the United States with the most perfect success. I feed my pigs on barley and maize-meal.

I am, sir, your obedient servant,

JOSEPH SAUNDERS.

[Inclosure No. 10 in Consul-General Merritt's report.]

My Berkshires answer admirably. My sows run out on grass land nearly all the year round, except when they have young. I have 260 acres of plowing, and I find swine dispose of my tail corn more profitably than sending it to market. I sell all my pigs for breeding purposes, having a good name for them.

TABLEY GRANGE,
Kemsford, Cheshire.

ALFRED ASHWORTH.

THE YORKSHIRES.

[Inclosure No. 11 in Consul-General Merritt's report.]

Pigs have been my great weakness. I have during the last twenty-five years tried all our English varieties. Berkshires, I found, were poor breeders and sucklers, and grew very slowly when from three to six months old. Tamworths were shy brutes and very slow payers or feeders. The small blacks and small whites are good breeders and fatten quickly at any age, but their meat is too fat for present tastes. The common English pig is a brute prolific enough but ruinous to fatten. I have found the middle white

and the large, white Yorkshire far away the best of all. They are very prolific, grow fast, and fatten quickly at any age, and the carcass is exactly what is now required either for pork or bacon purposes. I have now a herd of 340, all eligible for entry in the proposed herd-book which a few of us are trying to establish. I try to keep my pigs as naturally as possible, feed well, give plenty of exercise, and begin to breed from them early. I send them all over the world.

SANDERS SPENCER.

THE BLACK SUFFOLK PIG.

[Inclosure No. 12 in Consul-General Merritt's Report.]

District:

Mean temperature, 50° F.; temperature in summer, 60° F.; winter, 40° F.;

Soil, sandy preferable.

Subsoil geological strata, grit.

Pasturage, natural or artificial grasses:

How is stock housed? Warm and dry, avoid floors or walls which are good conductors of heat and cold.

Name of breed:

Suffolk small black-breed pig.

Size at maturity? 420 pounds.

Origin of breed:

Crosses between Essex, Chinese, Dorset, and other breeds.

Description, and how long pure bred? Thirty years or more.

Color? Black.

Maturity? Eighteen months.

Meat? Short, sweet, and juicy.

Black pigs are preferred to white ones because they stand exposure to the sun's rays better when out feeding on the pastures or clover leys in summer. During a greater portion of the year this description of pig will find its own living on good, well-drained pastures, with an occasional rain upon the stubbles or clover leys. They are small feeders and very contented and easy-tempered. When fattening it is sometimes difficult to get them to take sufficient exercise. They can be forced into early maturity, at six months of age, if required.

AKENHAM, Ipswich.

J. A. SMITH.

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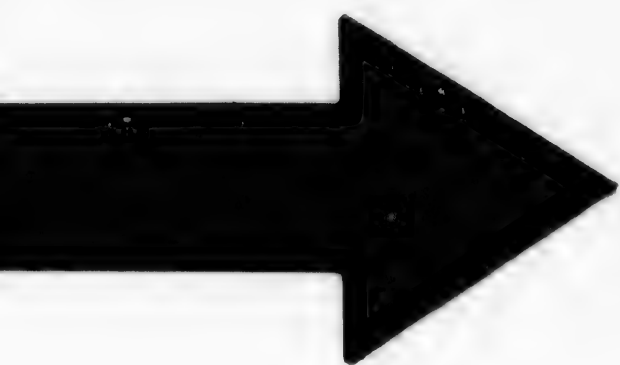
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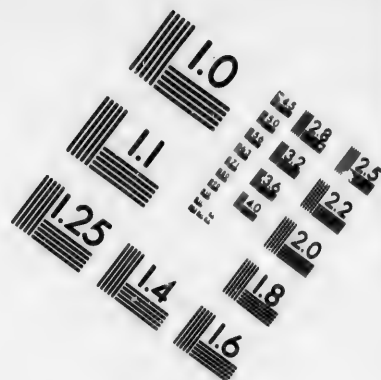
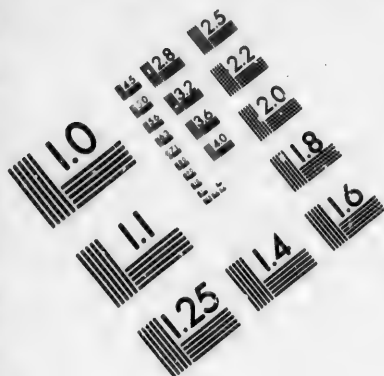
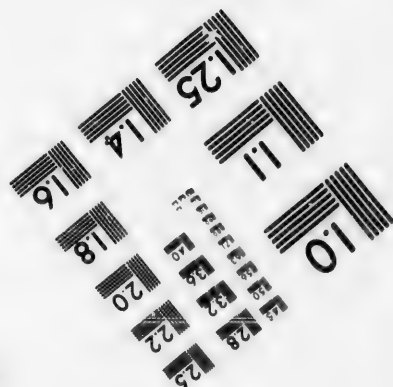
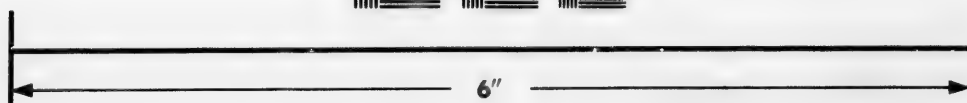
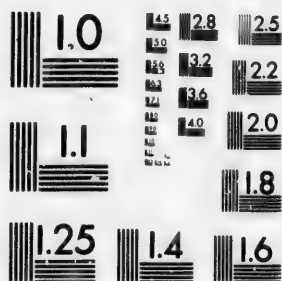


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